

JOURNAL of the American Veterinary Medical Association

FORMERLY

AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Assn.)

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WHO CAN TELL?

A letter recently received from one of our members, who had fallen somewhat behind with his dues, contains the following food for thought: "Business good but no collections. Farmers have no cash. Money grabbed by bankers for machinery and tractors, sold when times were good."

We were reminded of a paragraph we had read in one of Secretary Dinsmore's newsy letters to members of the Horse Association of America, as follows:

"A banker, who has recently loaned from four to five million dollars per month on farm lands, writes me that he has instructed all correspondent banks to do everything possible to discourage the purchase of tractors or trucks by farmers."

Who will ever be able to tell how much of the present difficulties, principally financial, in which our farmers find themselves, is not attributable, either directly or indirectly, to assuming obligations for tractors, trucks, automobiles and other expensive machinery that they were cajoled into buying by slippery-tongued salesmen, who were more deeply interested in commissions than agricultural prosperity?

One of the most sensible suggestions that has been made, aimed to aid the farmers in general, and those who grow wheat

exclusively, in particular, has been made by President Coulter, of the North Dakota Agricultural College. He advocates a federal loan of \$50,000,000 to farmers, for the purpose of assisting them to purchase live stock, and thereby to diversify their farming operations.

A LEGISLATIVE PROGRAM

Our Committee on Legislation has its work cut out for it this year. There are no less than five matters which need national legislative attention, and in which all veterinarians should be interested.

Senator Copeland, of New York, has introduced a bill (S-1671) providing for the compulsory testing of clinical thermometers. Our Association was invited to send a representative to a conference held under the auspices of the Bureau of Standards, in Washington, D. C., on January 30th, for the purpose of discussing the merits and demerits of the proposed bill. In this connection, it should be kept in mind that several millions of clinical thermometers are made and sold in this country each year, and, except in a negligible number of instances, the purchaser has no means of assuring himself of the reliability of the instrument purchased. As we see it, the greatest good to come of a law passed by Congress will be the deterring effect upon legislation of this kind by individual states, and the setting up of just as many different standards.

It is hoped that a bill will be introduced in the present Congress along the lines of a bill introduced last year, reducing the tax paid by veterinarians and physicians under the Harrison Narcotic Act. This act originally fixed a tax of \$1.00 per year, but the Revenue Act of 1918—a war measure—increased the rate to \$3.00. The amount collected under this act during the year 1922 was over \$600,000 in excess of the amount expended during the same year. The tax collected is paid into the general revenues of the United States, and does not go directly towards the enforcement of the act. The present tax is looked upon as essentially an occupation tax on veterinarians and physicians, and, as such, represents a discrimination against the veterinary and medical professions, since Federal occupation taxes are not imposed on other professions.

The Commissioner of Internal Revenue has ruled that a physician, who is away from home in attendance at a meeting

of a medical society, or while pursuing post-graduate study, is not away from home in the pursuit of his profession, and that the expenses incident to such travel and study are not ordinary and necessary expenses of the practice of medicine. Such expenses are regarded by the Commissioner as merely personal expenses, such as are covered by the provisions of the Income Tax Law, which allow to all tax-payers, without regard to their callings, or to the necessity for travel imposed by such callings, certain exemptions to cover personal expenses. Obviously, this ruling ignores the fact that such expenses arise in the case of a veterinarian or physician as expenses of his professional work, and the present interpretation is not in harmony with the provisions of the law generally, as they relate to medical practice.

We see another strong argument to show that the present ruling is unjust, in that a business man may deduct analogous traveling expenses (incurred in attending meetings of trade organizations, sales promotion conventions, etc.) as incident to the conduct of his business, in the computation of Federal income taxes. This apparent injustice has already been called to the attention of the Treasury Department Committee, studying such matters, but in the event of unfavorable action by the committee, the American Medical Association is planning to bring the matter to the attention of Congress. Our members should join hands with our sister profession in this worthy undertaking.

The attention of the Association has been directed to the apparent injustice of the present ruling in the matter of the allowance of alcohol for veterinarians. At present, veterinarians are allowed no more alcohol than is allowed to dentists, even though the only use to which a dentist puts alcohol is in connection with the annealing of gold. Veterinarians are now limited to two gallons of alcohol per year, and it is believed that this amount is entirely too small for the needs of this drug in connection with its therapeutic use in large animals.

Another matter which has been drawn to the attention of our Legislative Committee is the desirability of having apomorphin dropped from the list of drugs covered by the Harrison Narcotic Act. It has been pointed out that apomorphin is in no sense a habit-forming drug, and even though it is an opium derivative, it should not be classified with opium and morphin as a habit-forming drug. There is one possible objection in seeking legislative relief in this direction, however, and that is for the reason

that it might pave the way for other amendments that would weaken the present act.

Members interested in these problems and having any suggestions to offer should communicate with the Chairman of our Committee on Legislation, Dr. J. G. Ferneyhough. The committee is hampered neither by lack of funds or experience, and is in an excellent position to give a good account of itself this year.

IT WORKS BOTH WAYS

During the month of November the United States Department of Agriculture issued no less than three press releases directing attention to the increase in hog cholera. The first of these bore the caption, "One Hog in Twenty-five Dies of Cholera," and the opening statement was to the effect that "approximately four per cent of the hogs on farms in the United States died of hog cholera last year." The second of these articles carried the caption, "Hog Cholera on the Increase." The third called attention to the increase in hog cholera and "flu."

The purpose of these articles was undoubtedly good and they were unquestionably designed to call the attention of farmers to the fact that hog cholera is a preventable disease. Unfortunately, however, some or all of these press releases were used by the large city dailies and about the only part of the releases used by these dailies was the fact that hog cholera was on the increase and that one out of every twenty-five hogs dies of cholera. The effect produced on the average reader, by these newspaper articles, was to make him think that hog cholera is still the same menace that it was before the advent of anti-hog cholera serum.

To bear this out, we will repeat the casual remark of a layman who had read a newspaper version of one of these releases from Washington. His remark was: "You veterinarians still do not seem to be able to do much with hog cholera." This is to be regretted all the more, at this particular time, when other agencies are striving to direct attention to what the veterinary profession has accomplished in the control of hog cholera. This view of the situation, of course, was not the one intended by our Department of Agriculture, but it made a better piece of news to emphasize the heavy death rate for 1923.

DIRECTORY IN PRESS

The new Membership Directory is now in press, the first one to be published for three years. It should fill a much-felt need, not only by resident secretaries, officers and committeemen, but by our entire membership. We have a suggestion to make. When you receive your copy, see if your nearest fellow-practitioner is listed as a member. If not, find out why. Get him to join.

COMING VETERINARY MEETINGS

Wisconsin Veterinary Medical Association and Veterinary Short Course. College of Agriculture, Madison, Wis. Jan. 29-30-31 and Feb. 1, 1924. Dr. O. H. Eliason, Secretary, Madison, Wis.

Alabama Veterinary Practitioner's Short Course, Auburn, Ala. Feb. 4-9, 1924. Dr. C. A. Cary, Dean, Auburn Ala.

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York City. Feb. 6, 1924. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.

San Joaquin Valley Veterinary Medical Association. Hotel Selma, Calif. Feb. 6, 1924, 7:00 p. m. Dr. H. B. Wintringham, Secretary, 616 Broadway, Fresno, Calif.

Kentucky Veterinary Medical Association. Hotel Latham. Hopkinsville, Ky. Feb. 6-7, 1924. Dr. J. A. Winkler, Secretary, Newport, Ky.

Kansas Veterinary Medical Association and the Third Annual Conference of Kansas Veterinarians. K. S. A. C., Manhattan, Kans. Feb. 6-7-8, 1924. Dr. I. J. Pierson, Secretary, Lawrence, Kans.

Manitoba, The Veterinary Association of. Manitoba Agricultural College, Winnipeg, Man. Feb. 7, 1924. Dr. J. B. Still, Secretary, 711 Boyd Bldg., Winnipeg, Man.

Alabama Veterinary Medical Association. Feb. 8, 1924, Auburn, Ala. Dr. C. A. Cary, Secretary, Auburn, Ala.

Missouri Valley Veterinary Association. Kansas City, Mo. Feb. 19-20-21, 1924. Dr. E. R. Steel, Secretary, Grundy Center, Iowa.

Massachusetts Veterinary Association. American House, Boston, Mass. Feb. 27, 1924. Dr. C. H. Playdon, Secretary, Reading, Mass.

NO-LESION TUBERCULIN-REACTING CATTLE¹

By E. C. SCHROEDER, *Bethesda, Md.*

Superintendent, Experiment Station of the U. S. Bureau of Animal Industry

Among the disturbing factors with which the bovine tuberculosis eradication campaign has been forced to contend is the occurrence of so-called, no-lesion reactors, or cattle that react with tuberculin tests and in the bodies of which the post-mortem examination fails to reveal macroscopic lesions of tuberculosis.

This is a matter, as most men engaged in tuberculosis eradication work have learned through practical experience, that urgently requires investigation, not alone because it is desirable that its significance should be defined, but also to prevent its misuse by the enemies of eradication as an argument against the reliability of tuberculin as an agent for detecting tuberculosis, and, consequently, as it is generally admitted that the eradication of tuberculosis among the lower animals without the use of tuberculin is hopeless, as an argument against the whole, now active and promising bovine tuberculosis eradication program.

The commonly insidious and slowly progressive nature of tuberculosis, and the lack of information derivable from a tuberculin test, regarding the extent and age of the lesions in the body of a tuberculous subject, could well have served as the basis for the prediction, when it was undertaken to test hundreds of thousand and millions of cattle with tuberculin, that a fairly large proportion of instances would be encountered among tuberculin-positive animals, true subjects of tuberculosis, which had become infected too recently for macroscopically discoverable lesions to be present at the time of the test, slaughter and post-mortem examination. From some points of view it is really less surprising that no-lesion, tuberculin-reacting cattle are found than it is that they are not more numerous than experience has shown them to be, and that a large proportion of so-called, no-lesion, reacting cattle are true cases of tuberculosis, though occult to our unaided senses, is irrefutably proved by studies made in the Division of Pathology of the United States Bureau of Animal Industry during the last five years.

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

Last June I asked the Division of Pathology to give me a record of the no-lesion, tuberculin-reacting cattle from which it had obtained and studied material, and the more interesting and instructive portion of the data supplied me may be tabulated briefly as follows:

Year	Cases Studied	Proved Tuberculous	Per cent
1919	176	85	48.29
1920	799	197	24.65
1921	1296	258	19.90
1922	1422	290	22.37
1923	373	76	20.37

Total cases studied, 4066; proved tuberculous, 906, or 22.28%.

The earlier cases studied were all subjected to both microscopic examination and animal inoculation tests. Some of the later cases were not subjected to animal inoculation tests, but this, in view of the fact that the percentage proved to be infected with tuberculosis was greatest in the first year, should be looked upon as a reason for concluding that the percentages of later years are too low rather than as a factor that militates against their use as evidence to prove that macroscopically occult tuberculosis is very common among so-called, no-lesion, tuberculin-reacting cattle.

The decline in the percentage of cases proved to be tuberculous after the first year probably is due to the shorter time that was or could be devoted to the study of each case after the first year, and not to an actual decline of the percentage frequency with which the cases studied after the first year were affected with tuberculosis. But, if we disregard this probability and use the percentage of cases proved to be tuberculous among the whole 4066 studied during the five years as an index or guide, we may reasonably formulate a statement like the following:

If we keep in mind how difficult it is to select the proper material to search for evidence of tuberculosis from the large body of a no-lesion, tuberculin-reacting, bovine animal, and that at most only a few grains of material from each such animal can be thoroughly studied, the concrete evidence we now have to prove that more than twenty-two out of every hundred no-lesion, tuberculin-reacting animals are true cases of tuberculosis, justifies the conclusion that a great majority of no-lesion, tuberculin-reacting cattle are true cases of tuberculosis.

It is an instance in which the known facts about tuberculosis and tuberculin sensitiveness should have prompted the conclusion before concrete evidence was obtained, and in which the concrete evidence supports the conclusion which is theoretically correct, or an instance in which the circumstantial and the direct evidence are in complete agreement.

They who have had practical experience in the study of macroscopically occult cases of tuberculosis among cattle will not fail to recognize the conservative character of these statements. For example, my own experience includes an animal, in the early days of the use of tuberculin to diagnose tuberculosis among cattle, which reacted perfectly but was not proved to be tuberculous until after several competent investigators had spent each more than an hour on the microscopic examination of the most likely, or the most promising, material that could be obtained from it at an experiment station and not a slaughter-house autopsy. I also remember a number of instances in which tuberculin reactions among cattle were not explained until long and tedious post-mortem examinations, of a searching kind which certainly are not possible at slaughter-houses, revealed tuberculous lesions in unusual and unexpected locations, or in regions of the body in which tuberculous lesions are rarely found even in advanced and practically generalized cases of tuberculosis.

The insidious and often concealed nature of tuberculosis is well recognized by investigators, as the following quotations from the book on, "Tuberculosis in Man and the Lower Animals," published last year by Dr. Albert Calmette, Associate Director of the Pasteur Institute, at Paris, show. Calmette says:

"Infection first occurs unobtrusively and remains latent in the lymph or blood system for a longer or shorter time and discloses its existence only by conferring upon the infected organism the capacity to react to tuberculin."

He also says:

"Tuberculin has frequently been accused of having given a false indication because no tuberculous lesions could be found,"

and that,

"It was proven however long ago that in these circumstances the organs had not been searched with sufficient care,"

and that,

"Whenever a tuberculin reaction is positive, there exists somewhere a follicular lesion or at least a gland containing tubercle bacilli whose presence can be disclosed by experimental inoculation of the guinea pig."

The quotations from Calmette's book are important for three reasons: first, because the book undoubtedly is the most important, general summary of our knowledge on tuberculosis in man

and the lower animals published in recent years; second, because its author has devoted many years of study to tuberculosis in man and the lower animals and is widely recognized as an authority of the highest rank on the subject; and third, because one of his associates and co-workers is an accomplished veterinarian.

The last reason should be particularly interesting to the layman, as it requires no great acumen to comprehend that we cannot hope to gain a thorough knowledge of a disease which is widespread and common among men and the lower animals, and the long attempted control of which has begun to yield encouraging results only in recent years, unless veterinary and human medical knowledge and ability cooperate to discover and explain its mysteries.

Before proceeding it may be well to say that spontaneously healed or arrested tuberculosis among cattle has not been proved to be as common as among man, and that we have no valid reasons for assuming that cattle which react with tuberculin and show no other symptoms of tuberculosis are safe associates for tuberculosis-free animals in a sufficiently large proportion of cases to require special consideration from the point of view of possibly healed or arrested tuberculosis. It is better frankly to recognize that such evidence as we have proves that approximately forty per cent of all apparently healthy cattle that react with tuberculin are actual disseminators of tubercle bacilli.

Now, though it seems clear that most so-called, no-lesion, tuberculin-reacting cattle are macroscopically occult and incipient subjects of tuberculosis, there is no doubt that this does not fully settle the question of all no-lesion, reacting cattle, and at the Experiment Station it has long been known that tuberculin sensitiveness can be caused in several ways that may have practical significance in this connection.

Tubercle bacilli of the human type do not cause progressive tuberculosis in cattle; in fact, it has not been proved that they cause visible lesions of any kind in cattle unless they become lodged in tissues from which they are eliminated very slowly or not at all. The lodgment of the bacilli in such tissues is rare under natural conditions of exposure but is commonly effected through artificial inoculations. When cattle are drenched with human tubercle bacilli suspended in water, or with ground tuberculous lesions from human tuberculous subjects suspended in water, subsequent post-mortem examinations do not reveal

tuberculous lesions, but such cattle in some cases, not in all, react with tuberculin.

A peculiarity about their tuberculin sensitiveness is that it wholly disappears after the effects of a single, subcutaneous injection of tuberculin have passed off. That is to say, they react once and not again with a later test, and this peculiarity they have in common with cattle that have been sensitized for tuberculin through subcutaneous injections of pure cultures of tubercle bacilli of the human type, or through injections of tuberculous tissues from experiment animals that have been infected with tubercle bacilli of the human type, which is noteworthy, as the subcutaneous injection exposures almost invariably cause tuberculous lesions at the seats of injection, lesions which, though they soon become stationary and are afterwards slowly absorbed, contain virulent tubercle bacilli practically as long as they retain their tuberculous character.

Killed tubercle bacilli injected subcutaneously into cattle also cause a temporary tuberculin sensitiveness. In guinea pigs the sensitiveness caused by dead tubercle bacilli develops about as quickly as that caused by living tubercle bacilli; gradually increases until its maximum is reached; remains stationary for a number of weeks, and then seems slowly to decline.

Among the ways in which cattle can be sensitized with either living human tubercle bacilli or with dead tubercle bacilli, two require consideration, and one is of possible great practical importance, as causes of no-lesion reactions among cattle.

One is sensitization with dead tubercle bacilli, the importance of which now is negligible, as dead tubercle bacilli, which were quite common in tuberculin several years ago, virtually have been eliminated from it, or occur in it in such small numbers that they cannot account for sensitiveness to tuberculin among no-lesion cattle that are repeatedly tuberculin tested.

There is no reason to excuse the presence of dead tubercle bacilli in tuberculin, and I am glad to say that tests of commercial tuberculin manufactured and sold in the United States under Government license during the last year revealed no tubercle bacilli, either dead or alive.

The more important of the two ways is the sensitization of cattle through the ingestion of tubercle bacilli of the human type.

I feel confident that cattle which react with tuberculin and afterwards fail to show lesions of tuberculosis, and in which the

reaction cannot be accounted for on the basis of incipient and macroscopically concealed lesions, because they have in no way been exposed to bovine infection, on investigation will often be found to be cattle that have been exposed more or less severely to ambulant, careless, human subjects of tuberculosis.

As I stated in referring to the subject in an address on tuberculosis made several months ago, I know of one instance in which the feed of a number of no-lesion reaction cattle was prepared by an individual who shortly afterwards died of pulmonary tuberculosis.

No great imagination is required to picture a suffering, uneducated, tuberculous individual, to whom the preparation of the feed for cattle is intrusted, coughing over and actually spitting into the mixture. Tubercle bacilli in the sputum of advanced case of pulmonary tuberculosis often are very abundant.

It seems eminently desirable that all veterinarians engaged in bovine tuberculosis eradication work should gather data on the frequency with which no-lesion, tuberculin-reacting cattle, which cannot be looked upon as undeveloped cases of bovine tuberculosis because they have not been exposed to bovine bacilli in any discoverable manner, have been exposed to human tuberculous individuals.

While the human type of the tubercle bacillus does not cause tuberculosis in cattle, and human adults are strongly resistant against the bovine type of the tubercle bacillus, no difference has been recorded in the sensitization for tuberculin either type of the bacillus causes in animals into which they are introduced, and no differences have been recorded in the kinds of tuberculin the two types of bacilli produce.

Notwithstanding the commonly strong resistance of cattle against tubercle bacilli of the human type, it is not improbable that their persistent exposure to tubercle bacilli of the human type, freshly expelled by tuberculous persons, may lead to the development of tuberculous lesions in their bodies, which, after moderate and slow growth, become stationary and retrogressive. This probability is quite in harmony with some of the observations made at the Experiment Station fifteen to eighteen years ago during studies on so-called bovo-vaccination against tuberculosis among cattle. Bovo-vaccination required the intravenous injection of tubercle bacilli of the human type into cattle, and it was found that the frequency with which lesions resulted from such, ostensibly protective injections increased at an alarming

rate when repeated injections into the same animals were made, justifying the conclusion that persistent, intense exposure to tubercle bacilli of the human type may engender tuberculous lesions in the bodies of cattle.

Such lesions commonly were in unusual locations, and probably were of no importance with regard to the spread of tuberculosis among cattle, and somewhat similar lesions if caused by the exposure of cattle to human tuberculosis subjects would contribute nothing to the spread of tuberculosis among cattle. But, when meager lesions of tuberculosis are found in cattle, especially if they have an unusual character or an unusual location, and there is no way to explain their occurrence by discoverable exposure of the cattle to bovine, tuberculous infection, they would make interesting material to study with regard to the type of the tubercle bacillus they contain.

DISCUSSION

DR. V. A. MOORE: I am sorry that I heard only a part of the paper. I would like to ask for information. Do I understand you got the same reaction with tuberculin from any source, whether avian, bovine or human type? My experience with that in the past has been quite different—that you wouldn't get the reaction with the avian tuberculin, or we couldn't get a reaction in avian infections with the others. I wonder if that finding was in error.

DR. SCHROEDER: Dr. Moore, I did not speak of avian tuberculosis. I made the statement that no difference had been detected in the kind of sensitization produced by either the human or the bovine type of tubercle bacilli and that no differences had been discovered in the kinds of tuberculin, which either human or bovine tubercle bacilli produce. Avian tubercle bacilli and tuberculin are a different matter. Animals affected with avian tuberculosis, when tested with either human or bovine tuberculin, show a tendency to react, but nothing sufficiently marked to be practically serviceable, and the same has long been known to be true when animals affected with human or bovine tuberculosis are tested with avian tuberculin.

DR. J. A. KIERNAN: Reports were received during the year, covering the slaughter of 107,250 head of cattle. As close supervision as was possible was again given this work in order to reduce to a minimum the number of no-lesion cases appearing. These reports indicate that a fractional part of one per cent more no-lesion cases were found than during the previous year. In order to ascertain the source of these cases, investigations were instituted which disclosed the fact that 72.2 per cent of the cases in which no visible lesions were disclosed originated in infected herds. Of this 72.2 per cent, approximately 22 per cent were found in herds containing cases of generalized tuberculosis.

These figures seem to indicate that the situation is not quite so serious as would appear upon the surface, as the actual figures show that only 2,756 such animals, out of 107,250 reactors slaughtered, came from herds in which infection was not demonstrated by actual post-mortem examination. This is only 2.5 per cent in which it would appear that there were any doubts as to the diseased condition of the cattle. Based upon the total cattle tested (3,460,849) the possible error is only 0.08 per cent. In addition to the above, reports received indicate that 11.9 per cent of the total reactors were condemned as unfit for food purposes; that 1.4 per cent were sterilized; that 17.3 per cent were classified as undoubted spreaders of the disease; that 0.5 per cent were shown to have udder lesions; that 3.1 per cent were shown to have skin lesions, and that 0.7 per cent were found to have disclosed obscure lesions, other than the udder or skin lesions mentioned. These other obscure lesions,

it may be mentioned, were found in every conceivable part of the animal body, about sixty such unusual locations having been reported.

Of unusual interest in connection with reports of no-lesion cases is a study of tables which indicate that the lowest per cent of these cases reported over a period of three years was during the month of July of each year, and further, that this percentage gradually rose each month during each of the three years to the month of February, which showed the highest percentage of no-lesion cases. During the remaining four months of each fiscal year, a gradual reduction in percentage took place. This study, which may appear as only coincidental, is worthy of further attention, which it will receive during the present year.

DR. V. A. MOORE: I would like to inquire whether I understood correctly, that in 0.8 per cent there were microscopic lesions where macroscopically there were no lesions?

DR. KIERNAN: There were certain herds apparently free from tuberculosis in which a limited number of reactors were found. These animals, on slaughter, showed no lesions of disease. The percentage of such cases, based on the total cattle tested, was .08 percent.

DR. H. W. TURNER: In herds that have been tested a number of times, and have apparently been freed from tuberculosis, we often find in subsequent tests a number of animals giving a typical reaction, which on post mortem show no lesions. How do you account for this condition?

DR. SCHROEDER: Dr. Turner, I know nothing about such herds from practical experience. We must assume that the reacting animals in such herds have been exposed to tubercle bacilli, and I know that cattle that have been exposed to tubercle bacilli of the human type, though they fail to show lesions, may react with tuberculin. If cattle that react with tuberculin in supposedly cleaned herds are found to show meager tuberculous lesions, particularly if the herds are owned by institutions that number ambulant tuberculous subjects among their inmates, it would be very interesting to study the types of the tubercle bacilli that can be isolated from the lesions. I believe that by such studies we might secure concrete evidence that would throw light on this difficult matter, for which the explanation so far has remained largely theoretical.

DR. H. W. TURNER: These were state institution herds, where the animals are always more or less exposed to the possibility of human infection.

DR. J. A. ALLEN: I would just like to ask Dr. Schroeder what possibility there is of animals becoming sensitized after the repeated injection of tuberculin, or whether that would have any influence at all in the cases to which he has referred?

DR. SCHROEDER: The repeated injection of tuberculin would sensitize an animal only if the tuberculin contained dead tubercle bacilli in considerable numbers. I have tried to sensitize not only cattle but also small experiment animals by injecting them with single small doses, with single large doses and with repeated small and large doses of tuberculin, and I have never seen an instance in which an animal became sensitized as the result of such injections.

DR. E. A. WATSON: From the laboratory point of view, in saying that a case is negative to animal inoculations, how many glands or sets of glands, Dr. Schroeder, do you consider it necessary to inoculate before you can say whether that, from an inoculation point of view, is negative; that it might be due to tubercle bacilli?

DR. SCHROEDER: I am unable to answer Dr. Watson's question. As I pointed out in my paper, the data I presented were secured by the Division of Pathology of the U. S. Bureau of Animal Industry. I understand the glands selected were those that showed small hemorrhagic areas, or possibly small patches of edema. How many glands or how much material was studied from each animal, I do not know.

We are never certain that a tuberculin-positive animal is free from tuberculous lesions; therefore, as the reaction may be due to a focus of tuberculosis which is not found, we cannot know with certainty whether the reaction in an

animal in which no lesions are found is due to an undiscovered lesion or to the presence of tubercle bacilli that have caused no lesions.

DR. F. W. SCHOFIELD: I am not surprised at Dr. Turner's difficulty. It is to be expected in a herd that has been rendered free from tuberculosis. This herd is now tested annually to detect the presence of tuberculosis. Therefore, any lesions which occur are bound to be less than one year of age. Therefore, reactors, when slaughtered, are not likely to show very extensive lesions.

When we consider how farmers will still bring dairy products to their farm and feed it to the pigs, you have in some cases bovine tuberculosis existing in the pigs on the farm, for instance, and also I have seen cattle, from which tuberculosis has been nicely eradicated, mixing with the cattle on the next farm.

But the point I want to get at is that there are sources of infection surrounding that herd, and if you are going to get it, you are going to get it within one year after inoculation, which will possibly not be with very advanced lesions.

CHAIRMAN REED: Is there any further discussion?

MR. J. H. WHITTLESEY: I should like to ask whether avian tuberculosis in bovine animals is not exceedingly rare, but when it does occur it would not account for no-lesion reactions. On the contrary, as the tuberculin used to test cattle is the product of human and bovine tubercle bacilli, it is probable that some cattle which show tuberculosis lesions, though they do not react, may be the subjects of avian tuberculosis.

DR. R. L. CONKLIN: Mr. Chairman, I would like to ask Dr. Schroeder how long he believes an animal may be infected with tuberculosis of the bone, under a government test, before a reaction may occur?

I had occasion to test a cow which had come from an accredited herd in the State of Vermont and was purchased here in Canada and kept isolated until a year after the animal had been shipped here, and on the second test, testing it six months after arrival and a year after arrival, the animal reacted, and when slaughtered was found to have badly diseased lung and liver. I wrote to the Department, in Washington, and ascertained that this herd had been accredited for some time and no reactors had been found previous to the time this animal was shipped. I would like to know if he can give me any information as to the probable duration of this infection in this animal?

DR. SCHROEDER: It is difficult to determine from an examination of the lesions how long an animal has been affected with tuberculosis, because tuberculosis in some instances is a rapidly and in others a slowly progressive disease.

I believe that bone tuberculosis in cattle would rarely occur unless tuberculosis was present in other parts of the body, and when it does occur I do not believe that the time after its development, before the animal becomes sensitive to tuberculin, would be either longer or shorter than from tuberculous disease elsewhere.

Concerning the reaction or the failure to react of a single animal, such as Dr. Conklin has described, the possibilities of infection are so numerous that it is not unreasonable to conclude that the animal became infected after, rather than before, its removal from an accredited herd.

DR. SCHOFIELD: Are you sure, sir, that the lesion in the bone was a tubercular lesion?

DR. CONKLIN: It was tested upon experiment animals.

One thousand buffaloes will be taken from the Wainwright, Alberta, herd, and released in the region in which wood buffaloes are found. This is necessary because of the increasing size of the Wainwright herd.

DAMAGED SWEET CLOVER: THE CAUSE OF A NEW DISEASE IN CATTLE SIMULATING HEMORRHAGIC SEPTICEMIA AND BLACKLEG¹

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INTRODUCTION

Among many agricultural communities in North America an erstwhile noxious weed—sweet clover,²—has within a decade become recognized as a farm crop of remarkable value. The very general success of the crop has resulted in a tremendous increase in the acreage sown to sweet clover. In districts where the cultivation of corn for ensilage was threatened by the corn-borer, sweet clover has been introduced as a substitute. On light, gravelly soil, where other crops frequently perished, sweet clover was found to prosper. It is both chemically and physically beneficial to the soil, and in comparison with corn is more economical and convenient to handle in the production of ensilage. Under such circumstances the rumor that sweet-clover ensilage and hay was responsible for the death of cattle in widely separated districts of the Province of Ontario was a matter of much concern to the farmers and resulted in an immediate investigation.

HISTORICAL NOTE

During the winter months of 1921-22 many occurrences of a somewhat mysterious disease of cattle were reported to the College by local veterinarians. The early age of the animals attacked, combined with the peculiar location of the subcutaneous swellings, frequently resulted in an erroneous diagnosis of black-leg. When post-mortem examinations were made the discovery of numerous, large and small hemorrhages sometimes led to the verdict of hemorrhagic septicemia. Animals which were apparently quite healthy were reported as dying within a few hours after the operation of dehorning. A careful inquiry elicited the fact that in every case sweet clover had been included in the diet of the deceased animals.

Because of its excellence as a general description of the disease, mention must be made of an unpublished report which was

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

²There are several different species of sweet clover. *Melilotus alba* or white sweet clover is the species most frequently grown as a farm crop.

kindly prepared for the writer by James Brown, B. V. Sc., Markham, Ontario.

SYMPTOMS

At least two types of the disease are recognizable, viz., (1) the acute or hemorrhagic; (2) the subacute or anemic.

Symptoms of the acute type. The disease is often so sudden in its onset that the first indication of an outbreak is revealed by the carcass of a victim. On the other hand well marked and characteristic symptoms may be present. These are: Rapid pulse, blanching of the visible mucous membranes, and the presence of subcutaneous swellings. The animal is usually dull, standing quietly in the stall, and will often continue to take a little food until a short time before death. The temperature is not elevated but may be subnormal. When made to walk a stiffness in the movements is discernable. Constipation is common and impaction of the rumen has been reported. Slight bloating before death commonly occurs, while after death the whole carcass rapidly becomes distended with gas.

In fatal cases the animal becomes weaker, the pulse markedly accelerated, the visible mucous membranes very white, while the swellings may increase in size and number. The animals, in most cases, die quietly and in such a natural position that the fact of death may not be realized until some time after this has occurred. Occasionally posterior paralysis or cerebral symptoms are seen. In cases which go on to recovery the color gradually returns to the mucous membranes, the pulse becomes fuller and stronger, and the animal looks brighter and eats more heartily. The swellings pass away slowly. Death in this type of the disease is almost always the direct result of hemorrhage. In many cases the hemorrhage is exclusively internal, no exterior evidence being apparent. In such cases the diagnosis is facilitated by estimating the hemoglobin content and the clotting-time of the blood.

The nature of the swellings. The value of these lesions in making a differential diagnosis is of sufficient importance to warrant special consideration. A typical swelling contains no gas, is not hot, only slightly painful, and has no tendency either to suppurate or slough. These facts taken in conjunction with the rapidity of their formation indicate the non-inflammatory nature of the lesions. The swellings may either pit on pressure or fluctuate depending upon the rapidity with which they have formed. Most of the swellings contain either coagu-

lated or uncoagulated blood. Some are, however, purely edematous. They vary greatly in size, the smallest being scarcely perceptible while the largest may measure several feet in circumference with an elevation of many inches. They may appear on any part of the body but occur with greatest frequency along the back on either side of the vertebral column. They may be subcutaneous or intramuscular.

The subacute or anemic type. There is a possibility of misleading the reader by the use of the word "subacute." In this type the death-rate may be high but the disease is never so explosive as in the acute form. All cases cannot be classified under under these two heads yet the majority conform quite definitely to one or the other of these types. It is impossible to give any constant symptoms for this form of the disease, as up to the present time the diagnosis has always been made at the same time as the post mortem. It is more than probable that in many cases no symptoms of disease could be detected even though a careful examination were made before death. Included here are the cases of death following dehorning, parturition, and simple operations. In all of these cases the blood has been altered in at least one very important way, that of a delay in the clotting-time. Animals suffering from the subacute form of the disease die within a few hours after dehorning. Such animals bleed to death, due to the failure of the blood to coagulate. Out of a total number of twenty-two animals distributed among five different groups, and all being fed upon damaged sweet-clover hay, twenty-one died following the operation of dehorning.

Some interesting cases of the anemic type were discovered by a farmer who, following the traditions of the elders, cut a slice of skin and cartilage from the ears of all his yearling cattle and then retired for the night. This was to have had the mysterious effect of a blood tonic. The application of ligatures on the following morning saved his cattle from immediate death, but due to a continuation of the feed they all succumbed to the hemorrhagic type within a few weeks.

This form of the disease has been reproduced in rabbits, where the clotting-time of the blood was greatly delayed, the hemoglobin reduced, and the red blood cells badly damaged. A diagnosis can best be made by an examination of the blood.

MORBID ANATOMY

The acute type. The subcutaneous vessels are usually col-

lapsed and contain a little pale blood. The swellings are either purely hemorrhagic or partly edematous. When the latter are incised serum flows freely. Large and small hemorrhages occur with great frequency. The muscles are pale except when extravasated with blood. The healthy-looking flesh and sweet smell of the carcass do not suggest infection. The abdominal cavity usually contains much fluid and sometimes blood, clotted or free. Subperitoneal hemorrhages are very numerous and vary in size from mere petechiae to extensive suffusions, both in the visceral and parietal peritoneum. The rumen is usually covered with subserous hemorrhages. Ecchymoses are frequent in the small intestine.

Liver. Diagnostic punctate hemorrhages are almost always found in this organ. They appear as small circular black spots below the capsule. Pale areas of degeneration can usually be found.

Kidney. To the naked eye the appearance is normal.

Spleen. No visible change.

Lymph-glands. In most cases these are edematous. In an area where there is extensive, sero-sanguineous exudate, the lymph-glands may be greatly enlarged and the efferent vessels engorged with amber-colored lymph.

Diaphragm. Extensive hemorrhages are usually present.

Lungs. Small hemorrhages often occur in the parenchyma and under the pleura.

Heart. In every case ecchymoses have been observed beneath the endocardium. These are very pronounced in the left ventricle.

The anemic type. Only one case has been examined by the writer, that of a calf which died following the operation of dehorning. The superficial veins were empty. The abdominal viscera were normal save for marked edema in the wall of the abomasum and slight edema in the mesentery. Some lymph-glands were edematous. The abdominal cavity contained about 500 cc of clear fluid. There were well marked subendocardial hemorrhages. Veterinarians report that in this type of the disease the total quantity of blood is much reduced.

MORTALITY

The death-rate is always high. The figures given here represent eleven outbreaks only, as accurate data on mortality could not always be obtained. In 83 cases of the disease there were

17 recoveries, giving a death-rate of 79.4%. Most of the recoveries were among old animals.

DIFFERENTIAL DIAGNOSIS

The disease under consideration is frequently mistaken for hemorrhagic septicemia or symptomatic anthrax. Table 1 enumerates the points of difference between these somewhat similar diseases.

ANTE-MORTEM

	Disease Investigated	Blackleg	Hemorrhagic Septicemia
Local lesions (swellings)	Non-inflammatory. No gas.	Inflammatory and emphysematous.	Inflammatory and painful.
Temperature	Normal or subnormal.	Elevated.	Elevated.
Respirations.	Slightly increased.	Very rapid.	Very rapid.
General appearance.	Frequently normal till a few hours before death.	Acutely sick.	Acutely sick.
Visible mucous membranes.	Blanched.	Injected.	Injected.

POST MORTEM

Blood.	Pale and little tendency to clot.	Dark and coagulates readily.	Normal in color and coagulates.
Liver.	Shot with dark punctate hemorrhages (acute type).	No marked change.	No marked change.
Swellings.	Sero-sanguineous; the surrounding muscles pale; no odor.	Emphysematous; the muscles dirty-brown or blackish.	Sero-sanguineous; surrounding muscles normal.
Lymph-glands.	Normal or edematous.	Inflamed.	Inflamed.
Organism.	None present.	<i>Clostridium chauvei</i> .	<i>Pasteurella bovis-septica</i> .

It should be remembered that hemorrhagic septicemia and blackleg are not stable diseases but pasture diseases. The feeding of damaged sweet clover will naturally arouse suspicion.

TREATMENT

The most valuable method of controlling the hemorrhage when the ordinary mechanical means cannot be employed is the injection of freshly drawn blood-serum. The animals should be given plenty of water and a laxative diet such as bran mash. It is of great importance to keep the animals quiet, as anything that causes excitement increases blood pressure and tends to facilitate hemorrhage.

PREDISPOSING CAUSES

Age. Young animals are highly susceptible while the aged are markedly immune. This is well demonstrated in the Beeton outbreak. The animals were receiving damaged ensilage in quantities proportionate to their body weight. (Table 2).

TABLE 2.

Age	Total Number	Deaths
Between 6 months and 1 year.....	5	3
Between 1 year and 2 years.....	31	16
Over 2 years.....	22	0

In one case a calf was born which, within a few hours after birth, developed typical symptoms and died, while the mother remained well. In another case an aborted calf showed well marked lesions, the mother remaining perfectly healthy.

Obesity. The remark that "the best animals in the herd have died" was commonly made by the owners. This can most likely be accounted for by the fact that the fattest animals were the heartiest feeders and best assimilators.

Unusual exertion. There is quite a little evidence that excitement and severe exertion help to precipitate the disease.

SUSCEPTIBLE ANIMALS

Information on this point is at present very limited. Cattle are highly susceptible. Paulman¹ reports losses among sheep and a fatal case in a horse. The latter animal has considerable resistance, no cases having occurred in the outbreaks observed by the writer. Rabbits are very susceptible.

SOME UNUSUAL MANIFESTATIONS OF THE DISEASE

Apart from the typical forms of the disease already described, damaged sweet clover has been responsible for several cases of persistent and fatal post-partum hemorrhage, abortion and extensive edema. Hemorrhage into the eye has caused blindness, and cerebral hemorrhage paralysis.

ETIOLOGY

There is no longer any doubt in the minds of those who have had experience with this disease that it is always associated with the feeding of sweet clover. The point of dispute is the way in which sweet clover is responsible for the disease. In considering this problem, at least three possible ways suggest themselves. They will be briefly considered.

(A)—*Is sweet clover injurious because of a poisonous principle in the plant?*

In his book on poisonous plants Pammel² makes the following statement in regard to the sweet clovers:

"The sweet clovers contain the substance curmarin $C_9H_6O_2$, which is found in the tonka bean, sweet vernal grass, vanilla grass, etc. In Europe the sweet clover is suspected of being poisonous. Some years ago the writer conducted an experiment in feeding considerable quantities of sweet clover, but without any injurious symptoms resulting. According to Freidberger and Frohner, sweet clover causes paralysis of the muscles."

Although suggesting its poisonous nature, Pammel gives no proof, he merely cites opinions. Numerous experiments of the writer all indicate the harmless nature of the plant. Calves and rabbits have been fed on an almost exclusive diet of good hay and sound ensilage over a period of many weeks with no ill effects. One must also take into consideration the fact that thousands of farmers have been feeding sweet clover to their stock for many years with only occasional and localized outbreaks. There is the possibility that only at a certain stage of maturity does the plant become poisonous, or that only certain species are poisonous. Experimental work has practically eliminated these possibilities. The reasonable conclusion is that sweet clover can not be considered as a poisonous plant.

(B)—*Is sweet clover injurious because of a deficiency in some essential food element?*

A chemical analysis of sweet clover shows that it contains carbohydrates, proteins, fat and ash in sufficient quantities to satisfy the requirements of the body tissues. It would appear to be a well balanced food, and not likely to cause such acute conditions as are seen in this disease. Again, the verdict of the majority of those who feed sweet clover is that it is an excellent food for stock. If this were a deficiency disease, then the worst cases ought theoretically to occur among animals which were receiving an exclusive diet of sweet clover. This has not proved to be the case. The worst outbreak was among cattle receiving only a limited amount of sweet clover, while a liberal quantity of grain and hay was included in the ration.

The evidence is entirely against the idea of a deficiency disease.

(C)—*Is sweet clover harmful because of poisonous products formed in it by micro-organisms?*

In every outbreak investigated, as well as in the majority of reported cases, the sweet clover was found to be mouldy. A denial of the existence of mould was generally due to the fact

that the mould was concealed within the hollow stalks and thus not immediately visible. It can be said emphatically that the disease is produced not by good, but only by damaged clover. The presence of moulds is absolute evidence that at one time the sweet clover was a suitable medium for the growth of micro-organisms. The large colonies of mould are easily seen by the naked eye, while the small colonies of bacteria which are undoubtedly present escape observation. Whether the moulds or the bacteria were the ultimate etiological factor was an interesting problem to be settled.

The fact that moulds and bacteria have been growing in the plant tissues brings with it the possibility of the production of poisons, either directly as a specific secretion of the organisms or indirectly due to a splitting of the clover protein. The plant, being a legume, contains a large quantity of easily convertible protein (globulin) which is a real source of danger when infected with proteolytic organisms.

A very simple, yet very significant, experiment may be mentioned to advantage at this juncture. Good clover stalks and damaged clover stalks were hand-picked from the same hay mow. The good were fed to one rabbit and the damaged to another. The rabbit which ate the good remained well, while the rabbit which ate the bad died, showing typical lesions. This experiment was duplicated, using a different sample of clover hay. The results were the same.

In determining the cause of the disease the available evidence points to a toxic substance, developed by the activities of micro-organisms, growing in the sweet clover, as the responsible factor.

THE ETIOLOGICAL SIGNIFICANCE OF THE MOULDS

Mouldy food, for a long time, has been recognized as a common cause for sickness among animals, but the writer is not familiar with any instances where the moulds have been isolated, cultured, and used successfully in reproducing the disease. When food containing mould is condemned as the cause of disease, it is not because of any precise knowledge as to the pathogenicity of the moulds, but experience has frequently shown that mouldy food will kill animals. The mould is a very useful danger signal. It may or may not be of real danger itself, but it is a certain indicator of danger.

THE DISTRIBUTION OF THE MOULDS IN THE CLOVER

Most of the samples of damaged hay examined have shown

the presence of a dark mould growing both without and within the clover stem. Associated with this mould is a yellow variety found almost exclusively within the stem and easily overlooked unless its presence is expected. The quantity of mould visible on the exterior of the stalks may be very trifling, consequently the existence of mould in the hay is not infrequently denied by the inexperienced observer. The stalks which contain mould in their hollow centers usually have a dull appearance on the outside. The colonies of mould within the stalks are generally found opposite a place where the stem has been injured. The mould probably commences to develop on the outside of the stalks while the hay is in the coil. As the outside becomes dry the mycelia penetrate towards the centre and there continue to grow till the stalk becomes desiccated.

All mouldy sweet clover hay is not poisonous, the toxicity depending upon the species of infecting mould and possibly upon the species of the clover.

An investigation of the moulds rather than the bacteria was undertaken for two chief reasons: (a) The disease occurred in connection with ensilage that was mouldy, never with well ripened ensilage, although the latter is teeming with a variety of bacteria some of which are capable of altering the clover proteins. (b) There was a greater constancy among the species of moulds found in different samples of damaged clover than in the bacterial flora.

METHODS OF ISOLATION AND CULTIVATION

After many trials the following has been adopted as the most satisfactory method for aerobic isolation. Fine clover stalks are cut into half-inch lengths and spread in a single layer over the surface of an enamel dish, such as is used for plate development in photography. A larger dish covers the smaller, as in the petri dish. The stalks are soaked in water to facilitate cutting. A small quantity of 2% agar is poured into the dish, almost sufficient to cover the clover stalks. This mixture of stalks and agar is sterilized and when solidified is ready for use. Surface inoculations are made and dilutions from dish to dish in exactly the same way as in the isolation of bacteria by the surface-streak, plate-dilution method.

Media made in this way is superior to sweet-clover-extract agar and is much more easily prepared. Glucose can be added to advantage. •Due to the acidity few bacteria develop on this

media. The ordinary petri dish is far too small for the isolation of moulds, as the colonies rapidly coalesce.

Pure cultures can be maintained on potato media or sweet-clover-extract agar. By this method a number of different species of moulds have been isolated. The majority belong to the *aspergillus* variety. While these moulds can be readily detected by the difference in color, care must be exercised in differentiating, as the same species will vary greatly according to age and the nature of the medium upon which it is growing.

Several of the most prevalent species have been grown on clover stalks in pure culture and fed to rabbits with most interesting results. To grow in large quantities the mould is cultivated on clover stalks in glass flasks. It is important that the stalks should contain a suitable quantity of moisture in order to get a good growth. When either too moist or too dry the growth is very poor.

ANIMAL EXPERIMENTS WITH PURE CULTURE OF MOULDS

During the early days of the investigation it was discovered that rabbits were quite susceptible to poisoning when fed on mouldy sweet clover. They came down with both types of the disease. The fact that rabbits can be used in this way has greatly facilitated the work of testing out different strains of moulds and also in demonstrating to the unbelieving the effect of damaged sweet clover. Numerous experiments would indicate that good sweet clover, either in the form of hay or ensilage, is quite harmless to rabbits.

Experiment A—To determine the pathogenicity of isolated strains. Heavy cultures of the mould to be tested were prepared. The mouldy stalks were cut into small pieces, mixed with shorts and bran, and fed to the experiment rabbits. This was given twice daily with a small quantity of meadow hay and all the water they required. Some rabbits absolutely refused to eat the ration while others ate heartily. Quite a few rabbits died after the first few meals. The post-mortem examination revealed nothing of significance. Controls were fed a similar quantity of good clover stalks which had been autoclaved. Six different varieties of mould have been tested out on rabbits. Of these, two seemed to be quite harmless, while one produced a well-marked edema of the ear, and the other three all produced alterations in the blood or blood vessels.

One variety—an aspergillus—which has been isolated several times from mouldy clover hay, produces a disease in rabbits which very closely resembles the disease as it occurs naturally in cattle. Nine rabbits have been fed on this particular strain—aspergillus A—and in all cases except one there has been a marked increase in the clotting-time of the blood, followed in a few days by hemorrhage and death. The alteration in the coagulation time usually occurs between the fifth and the eighth days, the time required for clotting being increased from ten minutes to as much as one hour and a half. In fatal cases the blood may finally lose its power of coagulation.

The production of hemorrhage was generally facilitated by placing the rabbits in the warm incubator (37°C.) for half an hour and thus raising the blood pressure. In the case of cattle, pressure and strain on the weakened blood vessels frequently occur—for example when the animal arises from the stable floor, while in the case of a light animal living in a cage this does not take place to any great extent. Strain D. B., a penicillium, produced a fifty per cent destruction of the red blood cells, but only a slight alteration in the clotting time. Strain D. W., a mucor, had a similar but less effect to the one previously mentioned.

It was thought that a combination of these different moulds would reproduce more perfectly the disease than the use of any single strain. Damaged hay always contains several varieties of mould and the different manifestations of the disease which occur in cattle can most likely be accounted for by the kind of moulds present in the damaged hay or ensilage. In a recent experiment two varieties of mould were used in inoculating the clover stalks, and by accident a short bacillus, which is commonly found in the mouldy hay, also entered the mixture. A good growth was obtained and when this was fed to a rabbit a most typical case of the hemorrhagic type was produced. Table 3 gives a brief summary of this experiment.

TABLE 3.

Date	Hemoglobin %	Clotting-time	Note
August 15	80	5 min.	Began to feed
August 21	40	30 min.	
August 22	30	1 hr.	
August 23	8	Fails to clot	Killed

The post mortem showed extensive hemorrhage in the muscular portion of the diaphragm, into the abdominal muscles, with many smaller hemorrhages in the intercostal spaces and internal to the scapulae. The blood showed few platelets, many young red blood cells, and some normoblasts. It had entirely lost its clotting power but coagulated readily when fresh serum was added.

Experiment B—To determine whether other closely related legumes may become similarly toxic when they become mouldy. A heavy growth of a toxic mould, strain A, was obtained on red clover, alfalfa, and timothy hay respectively. When fed to rabbits over a long period of time no ill effects were produced, except in one of the rabbits receiving the alfalfa which died on the fourteenth day. Nothing definite could be found at the post mortem. Tests ought to be made with other species of moulds and bacteria.

Experiment C—To determine whether the different varieties of sweet clover are all and equally poisonous when mouldy. At present a report can be made on two varieties only. The white biennial has been found to be poisonous both when cut in early blossom and late blossom. The white annual, cut at time of budding, proved to be highly toxic. This refers to mouldy clover only. It was impossible by this method to determine the comparative toxicity of the different clovers due to the great variation in the appetites of the experiment rabbits. There is no doubt in the mind of the writer as to the ability of certain moulds to alter sweet clover, changing a harmless substance into something highly toxic, which is capable of producing in rabbits a disease practically identical with that which occurs in cattle.

An objectionable feature is the frequent necessity of feeding larger quantities of mouldy culture than is required to produce the disease when the naturally moulded hay is used, and the need of artificially raising blood pressure by means of the incubator.

The mould, apart from sweet clover, is apparently not poisonous except for very young animals. This was evidenced by a number of experiments in which massive doses of moulds cultured on potato were fed to rabbits without producing any typical symptoms. Some of the younger rabbits died after the first few meals. As in other experiments nothing definite could be found on post mortem in these young animals. Practically nothing

can be reported as to the effect of bacteria upon sweet clover. One culture alone has been thoroughly tried out, with negative results.

PATHOLOGY

Morbid histology. The findings recorded here are based upon the microscopical examination of tissues obtained from six cases of the acute type and one of the subacute type of this disease. Although the number of cases studied was not large, they were typical, and the nature of the lesions so constant that some definite statements with regard to the tissue changes can be made with certainty.

Liver. Under the low power the sections have a characteristic, blotchy appearance due to the alternation of normal and lightly stained, with degenerate and darkly stained areas. The cells surrounding the central vein have frequently undergone necrosis. They have lost their nuclei, appear swollen and homogeneous, and stain deeply with eosin. Whole lobules may be affected in this way. The cells at the periphery of the lobule are generally normal. The necrotic cells may be found in any part of the lobule. Between the outer, healthy cells and the innermost, dead cells are a few rows of damaged cells which take up the eosin readily and contain pyknotic nuclei.

Small and large hemorrhages occur with frequency. These are seen not only in the most damaged areas around the central vein but appear anywhere in the lobule. In one specimen there appeared to be evidence of destruction of the wall of a portal vein causing a hemorrhage into the surrounding tissue. There is an increase in the number of lymphocytes and leucocytes in the capillaries, but there is no evidence of infiltration around the necrosed areas. There is nothing indicative of inflammation. No fat was found in the acute cases, but in one chronic case there was some fatty degeneration around the central veins. This case, as well as one of the subacute type, showed a great many areas of hydropic degeneration.

Kidney. This showed evidence of nephrosis. It may be very acute, so that the cells lining the tubules have been destroyed and are desquamating, or of a milder type, with the epithelial cells granular, slightly swollen, and the nuclei of some pyknotic. Large globules having a hyaline appearance were frequently observed. Many of the tubules were filled with casts. There were a few small hemorrhages in the cortex. While there was

an intracapillary increase in the number of white blood cells there was no evidence of a leucocytosis or round-cell infiltration.

Spleen. The dehorned calf, which is considered as a subacute case, showed a large quantity of pigment. This was also found in the spleen of the acute anemic cases which occurred in the rabbits. The red blood cells took up the eosin very poorly.

Lymph-glands. Sectioned in two cases only. In the one the gland was normal and in the other markedly edematous. This latter condition was easily seen by the naked eye. Under the microscope the sinuses were found to be distended with lymph and there were several small hemorrhages.

Intestines. Sections from the intestines showed small and large hemorrhages. These were usually in the subperitoneal connective tissue, but may be either submucous or intramuscular. There was no evidence of inflammation.

Heart. This organ showed some degeneration of the muscle fibres of the outer fasciculi in the muscular pillars. Scattered here and there throughout the heart muscle were bundles of degenerate fibres. In two cases there was a definite infiltration with round cells and polymorphonuclear leucocytes around the damaged muscle fibres. Small hemorrhages were common between the muscular bundles. In all cases there was an extensive hemorrhage beneath the endocardium, covering the muscular pillars of the left ventricle.

Lungs. Showed no constant changes. In one instance there was well marked edema involving a few lobules. The alveoli were full of fluid and the capillaries engorged but there was no evidence of diapedesis or hemorrhage.

SOME NOTES ON THE PATHOLOGY OF THE BLOOD

A prolonged coagulation time and a low percentage of hemoglobin are two conditions frequently observed in connection with this disease whether experimental or natural. The acute form of the disease can occur without either of these changes, but in the subacute form it is most likely that both are always present to some extent.

As to the altered coaguability, with our limited knowledge of the intricate mechanism which is involved in the process of clotting, it is frequently impossible to determine with accuracy the reason for failure or delay in this common phenomenon.

To find out whether the delayed clotting time was due to the absence or inhibition of thrombin, a small quantity (.05 cc) of

fresh, human blood-serum was added to 1.5 cc of anemic blood which had lost the property of coagulation. Clotting began in less than a minute and was complete in four minutes. The addition of calcium chloride failed to bring about clotting.

It was thus discovered that the inability of the blood to clot was not due to a deficiency in calcium salts or fibrinogen, but due either to an absence of thrombin or an inhibition of thrombin. It is difficult to state which, as the blood contained platelets, though in reduced numbers. It is interesting to note that certain protein split-products—the proteoses, for instance—have the power of stimulating the liver to produce anti-thrombin. It is possible that such proteoses are formed in the mouldy clover, and that they indirectly are responsible for the altered clotting-time of the blood.

The low percentage of hemoglobin (readings as low as 10% to 20% of hemoglobin which occur in the experimental anemia of rabbits) is due to two causes: (a) a tremendous destruction of erythrocytes and (b) hemorrhage.

Intra-vital staining. When the blood from cases showing a low percentage of hemoglobin is stained with a 1% aqueous solution of crystal violet a great many reticulated erythrocytes can be seen. This would indicate that the bone marrow is doing all in its power to replace the erythrocytes which are being destroyed in the blood stream. The rapid recovery of the experimental cases gives further proof of the ability of the erythroblasts to repair the loss of cells, if the feeding of the toxic substance is discontinued. Normoblasts are not seen so frequently as would be expected.

WHAT IS THE MECHANISM BY WHICH THE DISEASE IS PRODUCED?

The answer to this interesting question must at present be speculative, yet it can be reasonable, if constructed upon the data obtained from the clinical and pathological study of the disease. One type of the disease is characterized by hemorrhage and the other type by anemia. It is not a contagious disease and nowhere gives evidence of inflammatory reactions. All cases of the disease show damage or destruction among the cells of the vital organs. These conditions, taken in conjunction with the fact that cases showing symptoms of acute toxemia have occurred, warrant the supposition that a powerful poison is most likely developed in the clover by microbial activity.

The massive hemorrhages most likely result from a rupture in a small arteriole, while the petechiae and ecchymoses can be explained by the same condition occurring in the small capillaries. A poison which is sufficiently powerful to destroy all the cells of a liver lobule surely possesses the possibility of causing degeneration in the walls of blood vessels and capillary endothelium. The theory that the hemorrhage is the result of the delayed clotting-time of the blood is not sound, and can be disproved by certain clinical cases.

The edema can be accounted for by a toxic paralysis of both the blood and lymph capillaries.

The destruction of the red blood cells, the necrosis of the liver cells, the marked nephrosis, and other changes can be explained only by postulating the presence of a poison circulating through the animal body, attacking and sometimes destroying the most vulnerable cells and tissues.

IMMUNITY

No work has been done in this direction, therefore no definite statements can be made. Circumstantial evidence would point against the development of immunity. In several instances sweet clover has been fed to stock with fatal results. The sweet clover has then been removed from the ration for a period of several weeks. With renewed feeding of even smaller quantities the disease has recurred. To the writer this suggests a lack of immunity.

MISCELLANEOUS EXPERIMENTS

Under this heading are grouped a number of experiments, all bearing upon the question of sweet clover and its relation to disease. Lack of space demands that the briefest summary possible be given.

Experiment A-1—To determine whether mouldy sweet clover is or is not harmful when fed to cattle.

Three calves were fed on timothy hay, good ensilage, and mouldy ensilage respectively. The feeding was continued for twenty-one days, when all were castrated. The calves receiving the timothy hay and the good ensilage remained well while the calf on mouldy ensilage died from hemorrhage several hours after the operation.

Experiment B-1—To determine the changes produced in the blood by the feeding of mouldy ensilage.

Two calves were employed. One was fed good timothy hay

and the other mouldy ensilage. The average clotting-time of the calf on mouldy ensilage was $28\frac{1}{2}$ minutes. The average time of the calf on hay was $11\frac{1}{2}$ minutes. Both were dehorned and the calf on ensilage died of hemorrhage three hours after the operation. The calf on the good hay remained well.

Experiment B-2—Six rabbits were fed on aqueous extracts of mouldy sweet clover. Three became acutely sick and three remained well. The latter were all old rabbits. In those which were affected there was an incubation period which averaged nine days. A very acute anemia was produced, fifty per cent of the red blood cells being destroyed in less than one week. The rabbits rapidly recovered when the extract was withheld. The clotting-time was also delayed. No immunity was developed, the disease reappearing when the extract was again fed.

Experiment C-1—To determine whether the mouldy stalks are more poisonous than the non-mouldy stalks in a sample of disease-producing, sweet-clover hay.

Six rabbits were used and three different samples of mouldy hay. The clean stalks were carefully separated from the mouldy stalks in each sample, and one rabbit was given the good and the other the bad. The three rabbits which ate the mouldy stalks died while the rabbits which ate the clean stalks remained well. (N.B.—This experiment would strongly discredit the idea of any natural poisonous principle being responsible for the disease.)

Experiment F-1—To determine whether good, sweet-clover ensilage, if fed in large quantities, may become harmful.

Four calves were used in the test. Two were fed exclusively on ensilage with a little bran, half a pound per day. The other two were given less ensilage and some timothy hay with the same quantity of bran. Two different samples of ensilage were used. The test was continued for five weeks during which time frequent tests were made. The animals remained normal and were successfully dehorned at the close of the experiment.

THE DIAGNOSIS VALUE OF HEMOGLOBIN AND COAGULATION-TIME ESTIMATION OF THE BLOOD

The following was the method employed in estimating the coagulation-time of the blood. A large-gauge needle was thrust into the compressed jugular vein and the blood caught in a test-tube with a definite diameter of one-half inch. The blood was collected to a depth of about two inches in the test tube. When

the blood did not flow freely through the needle a new needle was employed and a fresh attempt made. The test tube was then placed in a pan of water at 37°C. The clotting first occurs on the surface of the tube where the blood and air meet. The tube is occasionally tilted and when the whole of the blood has formed a solid coagulum, coagulation is considered complete and the time required recorded. With this technique the coagulation time for a normal cow varies from five to fifteen minutes. Errors can very easily be made. The test tubes and needles must be absolutely clean and the blood obtained from the vein without any delay.

The method of drawing the blood from the vein into a syringe and then transferring to a test tube is not so reliable as the direct flow into the test tube. (See table 4).

TABLE 4.

No.	Pulse	Clotting-time	Hemoglobin %
1	78	6 minutes	100
2	78	20 minutes	68
3	108	10 minutes	110
4	78	30 minutes	85
5	72	22 minutes	100
6	78	20 minutes	97
7	86	47 minutes	90
8	..	22 minutes	97
9	78	15 minutes	78
10	66	18 minutes	95
11	78	43 minutes	60
Calf (normal)	..	5 minutes	

At the time of testing this herd the animals were still receiving sweet clover in their rations and during the preceding few days six animals had died. It will be noticed that nos. 4, 7 and 11 gave a very much delayed clotting time. Animal no. 4 looked well and remained so. Animal no. 7 was not eating well and looked a little sick. Her pulse was fast. Animal no. 11 was a clinical case showing a diffuse swelling which extended down the left thigh. This could be seen only on careful observation. The percentage of hemoglobin is low in this case. Animal no. 3 proved to be of interest. This cow was apparently quite well at the time the test was made but was regarded with suspicion because of the high pulse rate. On the day following the test she suffered from a severe hemorrhage, but made a complete recovery. In all cases the pulse was accelerated and the animals seemed nervous.

The outbreak had been considered as probably hemorrhagic septicemia and while the stable had been thoroughly disinfected and the carcasses carefully removed, the feeding of sweet clover was continued. The farmer, who was a very careful man, denied that the clover hay was musty. A careful examination of the stalks revealed many that had colonies of mould within the hollow stems.

PROPHYLAXIS

The preventive measures suggested are based upon a belief that the disease is due to poisons produced by the growth of moulds and possibly other micro-organisms in the sweet clover. Whether moulds alone are responsible is a matter of little consequence from the standpoint of prophylaxis; they are always a danger signal. It is therefore a question of how best to prevent the development of these organisms. In the first place it must be borne in mind that the most important factors in the development of mould and bacteria are climatic, and thus outside the control of man. When the season is wet the hay is almost sure to be mouldy. The following practical suggestions are offered:

1. Sow only scarified seed, and sow heavily, not less than twenty pounds to the acre. This will insure a heavy stand, and the stalks will be thin. Moulds develop most readily on tough woody stalks.
2. The clover should be cut early, the most suitable time being when the crop is in bud.
3. Cure the hay in large coils and never draw in to the mow when wet. Mould will grow luxuriously on stalks that have been thoroughly dried if these later become wet.
4. Salt added to the clover at the time of stacking, in the proportion of about fifty pounds to the ton, seems to be very beneficial.
5. The hay must be protected from moisture which, during the winter months, may rise from the cow stable and condense on the fodder in the hay mow. This is very important.
6. In the case of ensilage, mould will not develop if the sweet clover is free from woody fibre, ensiled as soon as cut, cut short and thoroughly tramped in the silo. Exclusion of air in the silo means freedom from mould, and freedom from mould means freedom from disease. In every outbreak among cattle, where ensilage was being fed, the latter was coarse and dry, which had made close packing in the silo impossible.
7. If there is any evidence of mould the hay should be fed sparingly, and only to mature cattle and horses.

The making of hay from sweet clover is attended with real danger. No other hay crop becomes so definitely poisonous to stock when harvested under unsuitable conditions.

CONCLUSIONS

1. That the disease investigated is a new disease, and, while simulating hemorrhagic septicemia and blackleg, is entirely distinct from these diseases.

2. That the disease is produced by a toxic substance which is present in mouldy sweet clover. There is much evidence that certain moulds are responsible for the formation of this poisonous principle.

3. That the toxic substance produces the disease by destroying or damaging the cells of important tissues and vital organs. This may result in hemorrhage, delayed coagulation of the blood, and destruction of the red blood cells.

4. That there is no evidence to show that the feeding of good, sweet-clover hay or ensilage can produce the disease in question.

5. That the moulding of the hay and ensilage can be greatly reduced by observing proper methods of sowing and harvesting the crop.

ACKNOWLEDGMENTS

The writer wishes to express his appreciation to Dr. C. D. McGilvray, Principal of the Ontario Veterinary College, for his reading and helpful criticism of the manuscript of the report; also to Drs. H. E. Batt, R. Gwatkin and R. A. McIntosh, of the Ontario Veterinary College, for their frequent assistance in carrying on the laboratory and experimental work; and to Dr. L. H. Robinson, Pathologist at the Toronto General Hospital, for his valuable aid in interpreting the microscopical sections.

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- ¹Paulman, V. C.: *Veterinary Medicine*, xviii (8).
²Pammel, L. H.: *Manual of Poisonous Plants*, p. 552.

DISCUSSION

DR. E. A. WATSON: Mr. Chairman, I think Dr. Schofield has made a very able presentation of a very difficult subject. Sweet-clover poisoning, judging from the manner of its occurrence and manifestations opens up a number of viewpoints which apply, I think, not only to sweet-clover poisoning but to various plant and forage poisonings and intoxications. A point of much importance, and that needs emphasis, I think, is the epidemiology of these diseases. Dr. Schofield mentioned the common or universal prevalence of sweet clover but that the disease is met with only, as far as we know, in certain areas—an observation which seems to hold good with a number of so-called plant poisons, such as, for example, bracken poisoning, loco disease, and others. We know that on the eastern slope of the Rockies loco disease exists, and the loco plant is generally considered as the cause of the disease or as being associated with it, and yet when we come further up the range into the eastern slopes in Canada we have loco disease but we cannot produce the disease by feeding the loco plant, while down in Colorado they can.

It seems to me if one of these problems is solved in its entirety, that we may have a solution ready for some of the other different forms of plant poisoning which are so puzzling. We are too apt to attribute the disease to the plant itself, whereas there is a great possibility, if not a probability, that it is some organism or pathogenic fungus associated with the plant that produces the disease in the animal eating it.

I would like to ask one question of Dr. Schofield in regard to temperature. Dr. Schofield said, I believe, that a very important point in diagnosing the disease is that there will be no temperature. I would like to know clearly if

that was his experience in the animals in which the disease was experimentally produced. I have followed with some interest the discussion in England on bracken poisoning, in which Stockman and others have found a high temperature at the beginning of the disease.

When one goes into the field to see some of these cases, it is usually a day or two before the animal is dying and the temperature then may be normal or subnormal; but I would like to know if in the experimental cases which have been observed from the very beginning, and during the incubation stage, as it were, if the temperature is normal or subnormal from the very beginning?

DR. A. E. CAMERON: Mr. Chairman, may I ask Dr. Schofield what is meant by "scarifying" seed and why the process is carried out?

DR. JAMES BROWN: May I ask Dr. Schofield how he explains the lesions found in the calf born of a cow in which there was no evidence of the disease?

DR. J. DUNN: Dr. Schofield, in the experience with sheep did you have the same marked hemorrhages that you had in the other animals, or did they show any lesions or any trouble on sweet-clover pastures? I have found in my locality, where we have quite a lot of poisoning in sheep, though no post-mortems on them have been made, that by taking them off the pastures we had no more fatalities.

CHAIRMAN REED: We have so many different troubles apparently due to forage, that there must be other interesting cases that might be brought up in this connection.

In my own state we have a trouble rather difficult to explain, which is due to a summer grass commonly called "crab-grass," which under certain conditions seems to cause serious trouble with cattle and occasionally with horses. The disease always seems to be caused by the grass when it is affected with a mould. Just what this mould is, I do not know. In the case of this grass, we cannot trace the trouble to injury to the plant itself. The grass grows very near to the ground and of course is susceptible to various moulds. The trouble is quite general in our section, and I was wondering if we couldn't very properly study it from somewhat the same standpoint that Dr. Schofield has studied his sweet-clover trouble.

Has any one else any questions?

DR. E. A. BRUCE: As our Chairman has branched off a little bit, perhaps from the immediate subject, I thought I might mention something in connection with a mould that was concerned in an outbreak with which I had to do some years ago. In British Columbia, in an outbreak that eventually was diagnosed as being coccidiosis in cattle, we found, in this particular outbreak where one hundred cattle had died with intense dysentery, particularly in the abomasum, a mould that was growing all through the tissues, of a very characteristic shape, very much like a policeman's baton, one on top of the other. At the time, I had not, as a matter of fact, found coccidiosis in these cattle, as they were not mature animals, and we find in them it is very largely confined to the rectum.

In so far as the mould itself is concerned, I sent some of these specimens to a plant pathologist to have him look them over—a man who has quite a reputation on this side of the line. I was not able to see him personally when I went to his office and I left the slides for him. He came up to see me some time afterwards and he was unable to find anything on these slides, but as soon as the fields were picked out for him, he could see them quite plainly, showing that the plant pathologist, when put up against animal tissues, is apparently completely at sea.

We were unable to get anything out of that, but the interesting feature is that in these animals in which the mortality was very great, there is no question that the injury to the system through the coccidiosis was the primary cause. This stock was eventually sold to some Indians, at a very low cost, and, much to the disgust of the owner, with no ill effects.

DR. CHARLES S. CHASE: The question of the feeding of ensilage is one which has been a source of great disappointment by reason of our suffering considerable losses from time to time due to the ingestion of different moulds—the blue, the green and the pink moulds—and great losses have occurred along those lines. I would like to ask the essayist if in his work with the moulds on

the sweet clover he has found any specific remedies that will be efficacious in the treatment of the cases?

DR. SCHOFIELD: With regard to Dr. Watson's question, relative to temperature, when I stated that temperature does not occur in these animals, Dr. Watson, I meant that it did not occur in the clinical cases as far as we know. I have not taken any temperatures at all on experimental cases, and the reports I have received from veterinarians generally are that temperature does not occur. In the outbreaks that I have visited, I have always taken temperatures, because at first I thought that it was a most important thing to do, and I have seen well advanced cases with no temperature and early cases showing no temperature. That does not entirely answer your question. However, I could not tell you now just how many temperatures have been taken, but they have always been taken on the entire herd. We take temperatures on every animal in the barn. Neither the late cases nor the early cases—cases that went on to recovery or cases that went on to die—have been found to have any temperature; but that does not again, of course, exclude the possibility of there being a temperature at some time in the disease.

With regard to scarification of seed, it is found that in sweet clover, if the seed is planted without the outer, dense shell being scratched, scarified or injured, it frequently will not germinate. It might be of interest to Dr. Cameron to know that in the case of the bot-fly you have to have a certain amount of scarification of the egg before you can get the little beggar out, I believe, and it struck me the two things had something in common. The sweet clover is put into a machine and the seed is scarified. If the seed is not scarified, only about fifty per cent will germinate. There is a great difference between the seed which is scarified or scratched and the seed which is not. Therefore, if you have sown twenty-five pounds of unscarified seed, you will get a poor plant; the stalk will come up thick, and the tendency to mould is very great.

As to Dr. Brown's question, How did the calf get the disease when the mother was all right? I thought Dr. Brown would ask a question like that. In that connection I should like to suggest that when my answer proves a failure, we call upon Dr. Brown, Mr. Chairman, to give a reply. (Laughter). I would suggest this: That the calf possesses the younger tissue of the two; a tissue which has been rapidly produced—and we know that is the kind of tissue which is highly susceptible to this toxic substance.

In doing post mortems, it was found that some of the animals had warbles in the skin of the back. Around the warble, there was almost always hemorrhage. That was of interest to me and I attributed it to this, although I may be entirely wrong: That around in that location we had young granulation tissue, practically; new blood vessels were there; young tissue was there. Therefore, that accounted for the frequency of the hemorrhage around the warble. I don't say that entirely covers the case, but there it is. I have seen two cases.

In another case the calf had been aborted. When the calf was opened up, there was hemorrhage everywhere around the fetus. The mother was all right. That is the only explanation I have to offer. In the calf—the yearling or two-year-old—we find a high degree of susceptibility and also in rabbits of that age. You have a hard time producing the disease in older rabbits, whereas young rabbits go down with it readily. It is the young tissue which is most highly susceptible.

With regard to sheep, I have never seen any cases in sheep. I quoted that from Dr. Paulman and he did not state anything definite with regard to the hemorrhage in sheep.

With regard to cases coming down on pasture, that is an interesting thing. People say, "But this disease has occurred on pasture." I have not yet seen the disease produced when animals were eating it out on the field, but we must remember this: There is a possibility of it occurring in animals that are out in the pasture, if they are on old, sweet-clover pasture, where there are clover stalks which are old and decaying. But I think the cases of death which have frequently occurred in sweet-clover pastures have been due to deaths from

bloating. Animals bloat very quickly on sweet clover, although possibly not more so than on red clover, but that will occur.

I don't think there is anything to state with regard to your reference to crab-grass, except that I noticed the other day on a lot of the clover leaves along the roadside there were moulds growing on the clover leaves. I plucked some of them and looked at the leaves under the microscope, and could easily see the mycelial threads. There was a case in which the mould was growing on the living plant.

I am sorry I cannot say anything with regard to treatment for ordinary forage poisoning, because in the cases we have taken up, the treatment applies only to the conditions which have been produced in a peculiar type of forage poisoning, where you have hemorrhage as the cause of death. Therefore, if you can stop the hemorrhage, you can save the animal. In other cases of hemorrhage there are symptoms referring to the nervous system and the treatment is totally different. All the treatment I have suggested is simply referable to the type of disease I have been discussing. (Applause).

THE PRESIDENT'S APPOINTMENTS

In this number, we are pleased to publish President Stange's appointments of committees and resident state and provincial secretaries for 1923-1924. All of these appointees have been notified of their assignments by a personal letter from President Stange. Some of the committees and a number of the resident secretaries are already at work. The Legislative Committee has a particularly busy year ahead of it, as was shown in the preceding editorial. President Stange recently referred to the resident secretaries as our "field assistants," and, such being their status, we are going to work them to the limit. We are planning another membership drive. More later.

EXECUTIVE BOARD ELECTION

Nominations are being received for the election of a member of the Executive Board in District Number 4. It is indeed a free-for-all. At this writing the names of no less than twenty-nine members have been nominated. According to the rules, the five standing highest on the list will have their names on the election ballot to be sent out later. The polls for nominations will close on March 2, 1924. If you have not indicated your choice, do so, by all means. We have often said that our system for electing members of the Executive Board is the most democratic feature of our organization. Here is a chance to "stay at home" and vote too. Send in your ballot.

SURGERY OF THE CERVIX¹

By W. W. WILLIAMS,

Springfield, Mass.

To those who are not intimately engaged in the treatment of genital disease in the cow, surgery of the cervix usually appears as a somewhat distant and uncalled-for subject. Upon several occasions, I have demonstrated at meetings the circular amputation of this organ, and on each occasion, there seemed to be a question as to just what this operation was intended to accomplish. So, before entering into any details of surgical technique, it seems advisable to point out clearly what the indications are for such an operation. In doing this, one must have some understanding of the physiology and anatomy of this organ, know what mission it has to perform, how this mission is performed, and when in this it fails, and the reasons therefor.

Cases with which surgical treatment of the cervix is indicated are not relatively numerous, but they are so important among pure-bred cattle that the clinician should learn to recognize them promptly, and thus be in a position to insure their proper handling. He should not waste his efforts nor the money of his client by an attempt to treat a purely surgical case by other than surgical methods.

It is particularly when the infection penetrates the mucosa, becoming well established in the underlying mucous glands and musculosa, or when there is an induration of the submucosa or musculosa, that the treatment becomes a distinctly surgical problem. Surgical handling of cervicitis should be employed promptly whenever it is clear that the application of disinfectants to the part cannot yield a prompt and permanent recovery.

By operative procedure, diseased tissue is removed from the cervix, and a continuity of healthy mucous membrane is established. Its objects are two-fold: First, to bring about conception, and, second, to make pregnancy more secure.

Refractory cervical inflammations are very common, and they almost always interfere with reproduction. They may result from lacerations incurred at the time of parturition, may be secondary to severe, puerperal, uterine infection, or follow

¹Presented at the sixtieth annual meeting of the American Veterinary Medical Association, Montreal, Canada, August 27-31, 1923.

service by diseased bulls, with or without any perceptible indication of physical injury. At other times, severe cervical disease occurs as the result of unskilled treatment by veterinarians or others, especially when applying the old-fashioned, cervical-dilation method, which is still, in many quarters, considered a cure for all sterility, no matter what the cause may be.

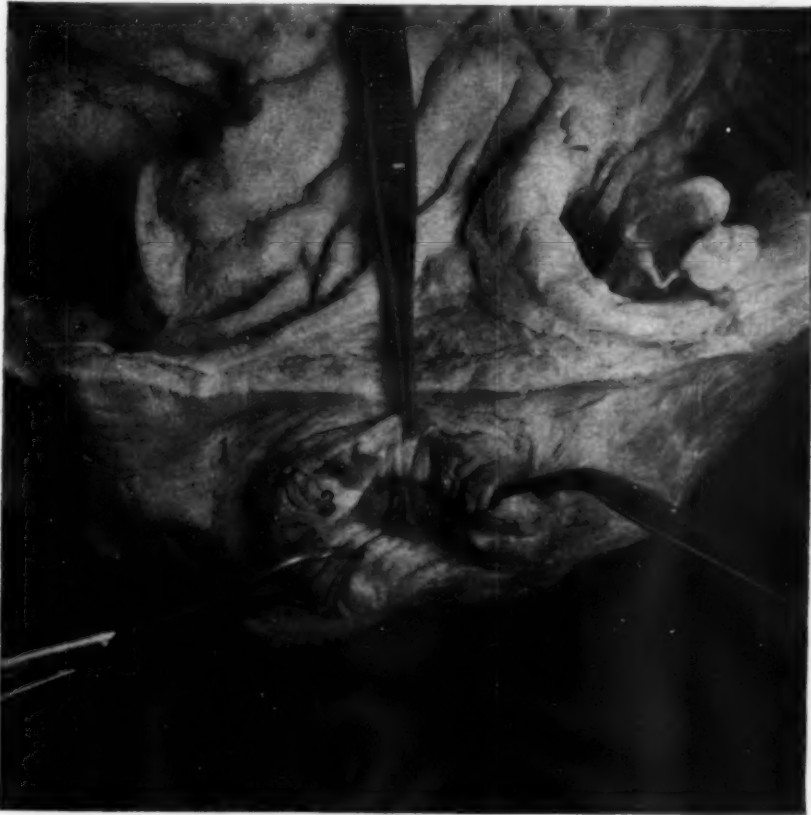


FIG. 1—Laceration of Lips of Cervix Uteri.

1, Vaginal mucosa; 2, vaginal aspect of cervical lip; 3, endocervical aspect of lip; 4, intensely inflamed first annular fold. On the right side are shown the margins of an old laceration, the posterior angles of which are held apart by the lower forceps. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

THE FUNCTIONS OF THE CERVIX

The cervix, constituting as it does the entrance to the uterine cavity, has several important functions to perform. It must first provide a free passage for the transmission of the spermatozoa forward into the uterus; then, when pregnancy occurs, form a thick mucous plug to seal the uterus hermetically, and lastly,

by means of a relaxation of its muscle fibers, allow the cervical canal to dilate sufficiently for the passage of the fetus, at the time of parturition. Its integral parts must be healthy if its function is to be normal. There should be a continuity of healthy mucous membrane lining the canal and the tissue lying under this membrane, that is, the muscular tissue should be free from infection and not indurated.

A pathologic secretion of the endocervical membrane may prevent the passage of the spermatozoa, or cause their early death. Occasionally the endocervical mucosa has been largely replaced by scar tissue. The condition is inimical to pregnancy. An inflammation or the presence of scar tissue each serves to prevent the formation of the mucous seal of pregnancy, without which pregnancy is insecure, in fact, usually aborted. Whether the seal is formed or not, the presence of a cervical inflammation or infection jeopardizes pregnancy, especially when the inflamed area extends well forward in the cervical canal, whence it apparently constitutes a constant source of contamination for the uterus.

Cervical endometritis is, as far as has yet been determined, the basic lesion in all cases which abort, and is the most prevalent lesion observed in animals with diseased genitalia. It is therefore very important that the clinician shall keep himself acquainted with the best therapeutics in the control of cervical disease. A low-grade infection allows conception more readily and thereby increases the opportunity for abortion, while a more severe form of infection makes it more difficult or impossible for the spermatozoa to migrate through the cervical canal and cause impregnation.

When impregnation does occur in the presence of an indolent cervicitis, the ovum is very frequently aborted so early that it is too small for casual detection. They are missed abortions, and are commonly referred to as sterile cows, since the only indication of abortion ordinarily presented is an increased interval between heat periods. It is thus that the question of the control of cervicitis is linked inseparably to the important phenomena, abortion and sterility, two terms which, although synonymous from a clinical and functional viewpoint, have nevertheless been brought into use in a manner such as to define as a disease entity, not a pathologic change or a pathognomonic symptom, but rather the sequelae of various pathologic changes which are common to the genital tract.

It has been unfortunate from the clinical standpoint that the common usage of these terms has been such, since the attitude thus established has led to the utter neglect of many cattle which abort. That is, the clinician has been led to believe by his colleagues in other branches of veterinary science that a cow which aborts is simply infected with abortion (whatever that may be), and thereby relieves himself of the burdens and responsibilities of clinical diagnosis and treatment, and keeps himself inexperienced or ignorant of clinical pathology.

In the virgin heifer and primipara, the annular rings are usually small and somewhat evenly placed. The cervical canal lacks the tortuousness common to multipara.

The cervix of the heifer is frequently infected and inflamed, but as a rule this is distinguishable clinically only by a slight induration of the annular folds, together with an increased rigidity of the cervix. In older animals, which have given birth to two or more calves, an inflammation usually causes more decided changes in the structure of the cervix.

For normal function of the cervix, it is apparently necessary that the mucosa of the first annular fold shall lie comparatively close to the external os. The cervical canal from the margin of the lips to the first cervical fold is normally lined with stratified squamous epithelium. At the first fold the transition is abrupt, the epithelium from this point anterior being of the columnar type. The squamous epithelium apparently does not serve so readily to conduct the spermatozoa as does the columnar type, for it is observed that when the area lined with squamous cells is greatly elongated, even in the absence of any indications of an inflammatory process, cervical sterility is common. Often, when the lips are elongated, there will be an inflammation of the first fold, it being well forward, perhaps two or three inches anterior to the lip margins. With these cases, there is rarely any beneficial result from other than surgical treatment, because, even if the inflammation subsides, the animal remains sterile until this cervical canal is shortened by the removal of the lips and the first fold.

THE PATHOLOGICAL CERVIX

The type of diseased cervix with which most veterinarians are more or less familiar is that in which an inflammation and swelling of the endocervical mucosa has caused an ectropion. The lips are pushed apart by the swelling of the mucous membrane,

and the first fold or perhaps also much of the endocervical membrane anterior to it protrudes out beyond the lips, forming an irregular, deeply creviced and angry-looking tumor. The ectropic portion may be as much as four to six inches in diameter. The degree of difficulty to be expected in obtaining impregnation is indicated by the relative accessibility of healthy endocervical mucous membrane to spermatozoa which may be deposited in the vagina.

For instance, it many times happens that when the first fold becomes ectropic, it pulls backward with it and exposes to view some healthy endocervical mucosa lining the cervical canal just anterior to the first fold. Healthy mucosa is thus brought into a position which is readily accessible to spermatozoa deposited in the vaginal cavity, although at the same time being surrounded by a fringe of ectropic tissue which may be highly inflamed. These cases often conceive readily, but the prognosis is very poor unless the inflammation has subsided and eliminated the foci of infection. Otherwise, it may ultimately be expected that the infection will permeate the tissues still further, and bring about a premature expulsion of the fetus.

When there is, along with the ectropion, an inflammation of the portion of the canal which has not become ectropic, the probability of relief by other than surgical measures is very remote. It is never safe to judge as to the health of the cervix by the appearance of the mucous membrane alone. Often a slight induration of the first annular fold or other abnormality in morphology gives the only indication of cervical disease.

The mucosa of the cervical lips is not usually involved in a cervical inflammation, excepting in the more severe cases. Occasionally an intense inflammation of the margins of the lips results from an infection of the nabothian glands, which become cystic, causing a considerable enlargement of the part. When the disease is confined to the lips, it is generally quite sufficient to lance the cysts and paint the margin of the lips and the craters of the cysts with an iodine solution. Usually the cysts will not recur. In itself, a small cyst in this region may appear of little consequence, but, looking at it from a broader angle with a general consideration of the clinical consequences which often develop from these apparently insignificant focal infections, it is apparent that these or other focal infections of the genital tract must not be overlooked.

MANY CASES TRANSITORY

By far the greatest proportion of cervical inflammations are transitory in character, being confined to a superficial, mild inflammation of the mucous membrane, especially that of the first fold. These cases require no surgery for their correction. When, however, the infection has penetrated deeply, other than surgical methods are usually of no avail. Most cases where the infection is deep-seated ultimately find their way to the butcher as incurably sterile, although they would continue, under proper therapeutics, perhaps for several years, as efficient breeding animals. When cervical disease is complicated by tubal or ovarian disease, or severe uterine changes which in themselves can interfere with reproduction, the case should be considered as inoperable. There is no benefit to be derived by operating upon a nymphomaniac.

The indications for surgery of the cervix are not so frequent that any but one devoting a large portion of his time to the treatment of genital disease will have sufficient occasion for cervical surgery to allow himself to become proficient in the technique required; but it is important that the average clinician should have a clear insight into the significance of cervical disease, be able to diagnose it and have some idea as to what treatment the case should have and what the prognosis should be.

OPERATIVE TECHNIQUE

The technique to be employed when operating upon the cervix must be decided upon by the particular merits of the case in question, but in any case, the principle involved is the removal of all diseased endocervical mucosa, together with such adjacent tissue as may be involved, establishing a continuity of healthy membrane lining the cervical canal and destroying any possible foci of infection in this region.

When the disease is confined wholly to a segment of the first fold, the base of which lies close to the os externum, with the position such that its removal will allow the preservation of the normal cervical morphology, then the operation can be limited to a simple exsection of the first fold. For this, an incision is made with a scalpel, through the mucosa at either side of the diseased fold, and the margins of the mucous membrane on the proximal side freed from the underlying tissue for a short distance, thus allowing free margins of mucosa for suturing. The scalpel is now directed into the underlying

musculosa, and by cutting first on one side of the fold and then on the other, a wedge-shaped piece is removed from the musculosa. This provides that the free margins of the mucosa may be brought together without undue strain being placed upon the sutures. The margins of the mucous membrane are sutured together either with figure-8 or interrupted sutures,



FIG. II—Circular Amputation of Cervix Uteri.

The vaginal mucosa has been dissected from and drawn forward over cervical core; 3, ectropic first annular fold; 5, exposed fibro-muscular tissue of cervical core. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

using a no. 0 or 1, 10-day, chromic catgut, and a $\frac{3}{8}$ or full-curved, $1\frac{1}{4}$ -inch, cervix needle.

In most cases, however, where surgical procedure is indicated, either the cervix is greatly elongated, necessitating a shortening of the cervical canal, or the infection has penetrated into the submucosa or musculosa, requiring that a more extensive dis-

section be made in order that all of the diseased tissue may be removed and the normal physiological relationship of the tissues re-established. This is accomplished best by a partial circular amputation of the cervix. This operation is adapted for the removal of diseased cervical tissue as far anterior as it may be desired to carry the operation and at the same time leave the remaining portion of the cervical canal absolutely free from all

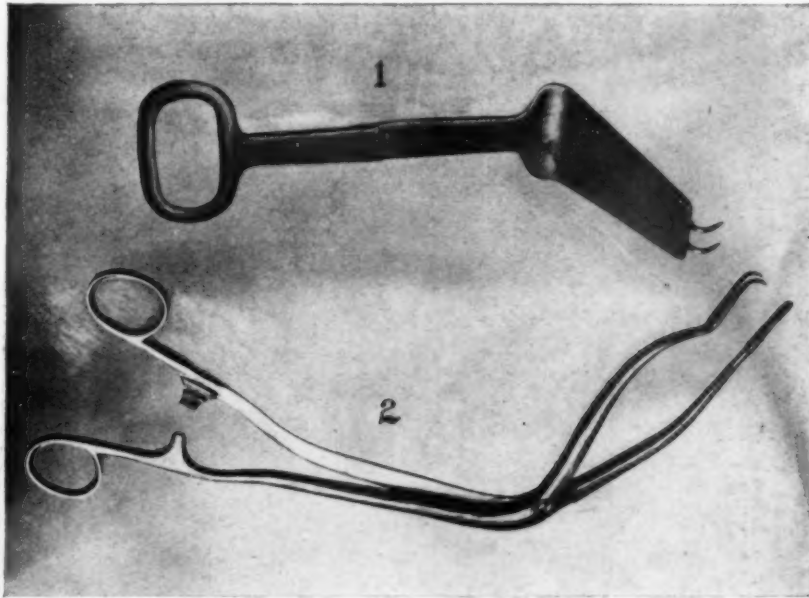


FIG. III—Special Instruments for Trachelectomy

1, Cervical retractor; 2, tenaculum forceps. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

surgical injury. This type of operation is generally adaptable to all cases where cervical surgery is indicated.

CIRCULAR AMPUTATION OF THE CERVIX

The cervix is retracted into the vaginal introitus by means of a number of vulsellum forceps or strong artery forceps, clamped onto the margin of the lips, and with the aid of a special vulvar retractor (having two tenacula points which are secured in the vaginal mucous membrane at the side of the cervix), the vulvar lips are pushed aside and the cervix freely exposed. The field of operation is injected at frequent intervals with a local anesthetic, to which a small amount of adrenalin chloride has been

added. (If the animal is of a nervous disposition, it is well to give chloral hydrate (2 to 4 oz.) orally about an hour before operating.)



FIG. IV—Circular Amputation of Cervix Uteri.

Cervical core divided by longitudinal incisions (6) into superior and inferior segments, (4). The internal os (7) is shown, bounded posteriorly by the now exposed second annular fold (amputation ends at this point) leaving a free margin of endocervical mucosa as shown in figure V, 8. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

A circular incision is now made through the vaginal mucosa about one-half inch peripheral to the margin of the cervical lips, and the freed margin of the vaginal mucosa grasped at

frequent intervals with hemostats. It is then carefully dissected away from the underlying cervical tissue for a short distance, when loose areolar tissue is met with, allowing the



FIG. V—Circular Amputation of Cervix Uteri.

Showing cervix after superior half of cervical core has been excised. 9, margin of vaginal mucosa; 4, inferior half of divided core; 8, semi-elliptical margin of endocervical mucosa; 7, utero-cervical canal. Between 8 and 9 the structure consists of the loose paracervical tissue and the tough cervical fibro-muscular tissue. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

further separation of the cervical core from the vaginal wall to be carried out as far forward as may be desired by simply retracting the cervical core sharply, and with the index finger

separating it from the vaginal wall, tearing down the loose areolar tissue with which it is surrounded. (See fig. III.)

When the body of the cervix is thus enucleated, as far as it appears to be diseased, the core is bisected, making a longitudinal incision through it on either side as far forward as indi-

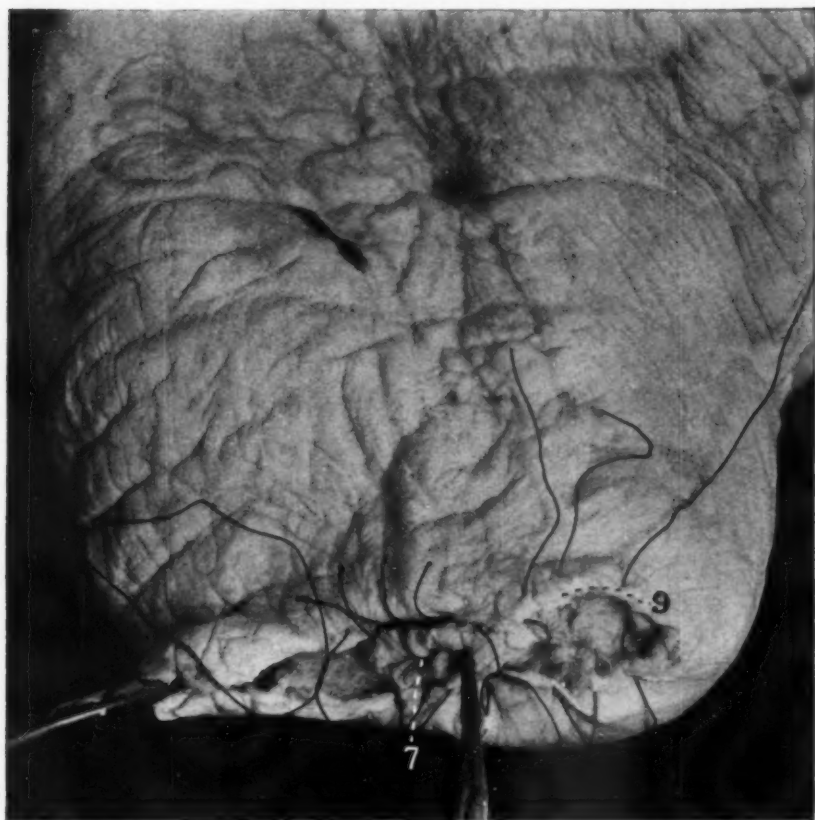


FIG. VI—Circular Amputation of Cervix Uteri.

Showing cervix after excision of both superior and inferior halves of cervical body. Vaginal mucosal margins brought into apposition above and below with the endocervix. Angular sutures at either side bring into apposition the vaginal mucosa and the lateral margins of the endocervical mucosa. On the left side the puckered vaginal mucosa is shown free from its underlying support; on the right it has been removed, leaving an oval opening (9) in the mucous membrane. Vaginal sutures are shown on the right side, each of which includes a small portion of paracervical tissue along with vaginal mucosa and utero-cervical canal. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

cated. Then, using the lower segment for traction, to hold the cervix well into the vaginal introitus, the superior segment is grasped with forceps and pulled sharply upwards, exposing the endocervix as far forward as the two longitudinal incisions have extended. A semi-elliptical incision is now made through the

endocervical mucosa, connecting the anterior ends of the two longitudinal incisions, the convexity of the incision being directed posteriorly. The mucous membrane of this convex portion is separated from the underlying tissue, thus allowing a freely accessible margin for the placing of sutures. The incision is then carried through the muscular and fibrous tissue, completely severing the superior segment. (See figs. IV and V.)

Using 20-day, chromatinized, catgut sutures, size no. 2 or 3, with a $\frac{3}{8}$ or full-curved, cervix needle having a piercing point, the free margin of the vaginal mucosa is brought into apposition with the endocervical mucosa below. Usually three or four interrupted sutures suffice to appose these margins. Each suture should include a small bit of the underlying muscular tissue, in order to cause the firmer union of the parts and eliminate tension on the mucosal margins. At this point of the operation, the cervix is grasped by a specially constructed tenaculum forceps, one jaw having double tenacula, and the other jaw being tongue-shaped, such that it may be passed deeply into the cervical canal without injuring the endocervical mucosa. It is particularly important that the cervical stump should now be firmly grasped with these forceps, because their replacement would be very difficult, should their hold be lost.

The inferior segment of the cervical stump is now excised and sutured in a like manner to that of the superior segment. The endocervical mucosa is thus coapted to the vaginal mucosa, both above and below, but at the lateral commissures, the vaginal mucosa sags away from the endocervical mucosa, owing to a great reduction in the diameter of the os, the vaginal incision being as great as five or six inches in diameter in many cases, while the diameter of the os uteri is reduced to as small as one-half inch. (See fig. VI.)

Coaptation of the vaginal mucosa to the lateral margins of the endocervical mucosa is now secured by a suture on each side through the vaginal mucosa from above, inward, about $\frac{1}{4}$ inch lateralwards from the previous suture (using no. 4, 20-day, chromic catgut), through the lateral margin of the endocervix and out through the vaginal mucosa below at about $\frac{1}{4}$ inch lateralwards from the previous lateral inferior suture. When these angular sutures are drawn tight, the entire circumference of the endocervical mucosa has been coapted to the margin of the vaginal mucosa. At either side there now remains some superfluous vaginal mucosa. Each lateral commissure of

the vaginal wound is now seized with tenaculum forceps and, by gentle traction lateralwards, the extent of superfluous vaginal mucosa ascertained.

An approximately oval-shaped portion of the extravaginal mucosa is now removed with curved scissors from each side, and the margins apposed with interrupted sutures, preferably



FIG. VII—Circular Amputation of Cervix Uteri.

Operation completed. (From *Diseases of the Genital Organs of Domestic Animals*, by W. L. Williams.)

of no. 4, 20- or 40-day catgut, each of which should include a portion of the underlying paracervical tissue, thus eliminating any dead space underneath the mucosa and insuring a prompt and firm union of the apposed tissues. (See fig. VII.)

The operative area is now painted over with tincture of iodine or pure Lugol's solution of iodine, and the cervix allowed

to return to position. No further dressing of the area is required. If the tissues are properly apposed, healing occurs by first intention, and union is firm enough within ten days or so, that the cow may again be placed in service.

DISCUSSION

DR. A. SAVAGE: Mr. Chairman, Gentlemen: This is Dr. Williams' own particular operation in his own special field, and my limited experience scarcely warrants any lengthy discussion of it. Most of us are doubtless familiar with the frequency of cervicitis as an obstruction to breeding, particularly in dairy cattle. Mild cases may be successfully treated, when not of too long standing (and happily that is a large proportion of the cases), by the classical method of swabbing once or twice at, say, weekly periods, with pure Lugol's solution. There are cases, however, which are distinctly out of that class. They refuse to yield to ordinary medicinal treatment, and present a bit of a problem. Being afraid to apply surgery to some of those cases and taking a tip from Dr. Pringle, of Toronto, I treated a few of them by using something more drastic, and added, in a few instances, twenty per cent of formalin to pure Lugol's. In some cases that mixture brought results. It was particularly penetrating, and reached the bottom of those mucous folds which had escaped the action of Lugol's.

There are cases, however, which will yield to no medicinal treatment, and they undoubtedly call for surgical interference. My experience with this particular type of operation has been very limited. To begin with, as an objection to it, I must say that I do not think it is universally applicable. There are animals, particularly beef-type, Shorthorns, (and I encounter them fairly frequently) in which it is impossible to retract the cervix satisfactorily, so much so that swabbing is a difficulty, and certainly an operation of this sort would be impossible. I have tried it three times, learning only as recently as last night that my technique was wrong in all three cases, so I cannot hold that against the operation. The first animal died; the second animal was destined for the butcher, so that she eventually died under the axe and not of the operation. My third attempt was done on a better type of animal, a dairy cow, and I am very pleased to say that I got results. The cervix, when healed, somewhat resembled a grain sack with two ears, because I did not take care of the corners of my wounds properly, but nevertheless the animal conceived, and is now pregnant.

In spite of my clumsy efforts to follow him, however, I think Dr. Williams is to be distinctly congratulated. This is, I believe, *the first definitely constructive operation on the animal genital organs*, and as such, regardless of its technical difficulties, should be the source of a great deal of credit to Dr. Williams. (Applause.) I only trust that, in time, the veterinary profession and live stock interests, particularly those concerned with dairy cattle, will realize the debt they owe Dr. Williams in this respect. (Applause.)

DR. WALTER SHAW: I want to ask Dr. Williams in regard to a forceps that is on the market. In a great many herds, in the treating of sterility, a man will be treating seven, eight or nine cows, and the forceps are most generally quite heavy-tonged. Now, naturally, when you are in a herd of that type, you may run into anything. A great many times this same heavy instrument is used to retract the uterus, by taking hold of the cervix.

I notice in regard to this forceps it has been mentioned that the smooth part was to enter the cervix. However, this forceps that is on the market is the same on both sides. Isn't the taking hold of the cervix with that heavy instrument conducive to cervicitis? I have re-examined these cows that have been treated in that manner, within a few days, and have found a severe inflammation of the cervix. Personally I have discarded forceps, and use the return douche by placing the hand through the rectum. By manipulating the cervix, you will get hemorrhage from the points where the forceps have been used.

DR. W. L. WILLIAMS: In the old type of forceps which is generally used in the retraction of the cervix, there is an opportunity for error, which is very commonly made, which consists of closing the forceps too tightly and crushing the tissues so that they become necrotic or are otherwise seriously damaged. The forceps should grasp only the lips of the cervix and not engage the folds or pass into the cervical canal proper. They should not be closed too tightly nor too great tension applied. If one has in mind these dangers, they may, as a general rule, be avoided. Turn whatever way we may, there are certain dangers.

If we take the plan of the previous speaker, there are certain dangers of injury to the cervix and uterus, because they hang somewhat flaccid, and the instrument is liable to be misdirected. Also, when neither forceps nor speculum is used, the inspection is interfered with; one does not see the cervical mucosa, and consequently the diagnosis is defective. It is important that we see the cervix. In beef and dairy Shorthorns it is often impossible to draw the cervix back far enough to see it. It is not necessary to insert the forceps jaw into the cervical canal of heifers. I often take hold of the vaginal mucosa on either side, and do not touch the cervix at all.

DR. B. T. SIMMS: I would like to call your attention to the difference in the appearance of the cervix before the forceps is applied and after the forceps has been used. In my own experience, I made the mistake many times of using the forceps, drawing the cervix back to where it was easily seen, and making a diagnosis of inflammation when no inflammation was present. The manipulation of the normal cervix with forceps, particularly when we are more or less awkward, will result in hyperemia, so that when the cervical mucosa comes in view it is dark red.

SECRETARY DINSMORE USES RADIO

On December 18, 1923, at the invitation of the American Farm Bureau, Mr. Wayne Dinsmore, Secretary of the Horse Association of America, spoke over radio KYW, at Chicago, on "The Horse—Man's Companion, Servant and Friend." On January 9th, through the courtesy of Brown & Bigelow, he spoke over radio WLAG, at Minneapolis, on "The Value of the Horse in Commerce." Letters received by Mr. Dinsmore, from listeners in far distant points, show that both radio addresses had been widely heard.

TICK ERADICATION PROGRESSES

The efforts of the United States Department of Agriculture and the States cooperating to eradicate the cattle tick in the South are gradually contracting the infested area, in spite of obstacles which are the more troublesome as the end of the long campaign against this costly pest seems to be in sight. Recalcitrant communities are liable to remain longest under quarantine, since they cooperate but grudgingly; nevertheless, the latest revision of the Bureau of Animal Industry orders to prevent the spread of the tick and Texas fever showed that on December 28, 1923, there were 73 fewer counties showing some ticks than a year ago.

FLUKES OF THE GENUS COLLYRICLUM AS PARASITES OF TURKEYS AND CHICKENS¹

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During the past year there has come to our attention the fact that a rare and peculiar trematode parasite of passerine birds may also affect chickens and turkeys. This fact seems never to have been noted before, and hence we have collected such data as are available regarding the outbreaks in Minnesota.

In June of 1922 there was brought to the University of Minnesota a six-weeks-old chicken, with a conspicuous group of what the owner described as "blisters" about the vent. At the time, the material did not come to the attention of the writers, but, on the basis of material from birds in the laboratory collections, was identified by Miss Laurene Krogh as cysts of flukes of the genus *Collyriclum*. Fortunately some of the material was preserved by Dr. W. L. Boyd, together with a memorandum as to the owner and location of the affected flock, which was some twenty-five miles from Minneapolis.

On June 29, 1923, a turkey similarly affected was sent to the Veterinary Division of the University by R. C. Shaw, County Agricultural Agent of Northern Ottertail County, some hundred and sixty miles northwest of Minneapolis. The owner reported that a number of his poults were affected, and that some were dying as a result of the condition. It was immediately recognized that this was the same condition that had been noted the year before in the chicken.

The cysts (figure 1) were not limited to the perianal region, but, in addition, extended as a berry-like mass on the ventral surface of the body, immediately anterior to the anus. There was also a group of seven cysts in the skin of the pectoral region. No others were noted on this particular poult.

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So striking was the condition, and so unique, that the writers made a trip to the locality and farm of Mr. Albjerg, of Vining, Minnesota, the owner of the affected flock.

The surprising fact developed that out of the 110 poults, six to eight weeks old, fifty showed the cysts of the parasite. It was very significant that, as far as could be determined, all of these birds had from the outset the run of a lake shore, some



Fig. 1—A six-weeks-old turkey poult, showing perianal and abdominal groups of cysts of a fluke, *Collyricium*

twenty-five rods from the barnyard. The latter was on a considerable elevation, high and dry. Moreover, the young turkeys had spent the entire time, during the first few weeks, at the lake-side, hovered by the hens, at night, in a marshy meadow near the lake.

On the other hand, the unaffected poult had been reared on the high ground, without any access to the lake. The owner was confident that if there were any parasitized birds in this group they were strays from the other broods.

Careful examination of the affected poult showed the same general condition that had been seen in the first one examined. However, it was found that the cysts were much more widely distributed than had been at first supposed. In various cases they were found to extend quite generally over the ventral surface of the abdomen and breast. In rare instances they were found even about the beak, both on the external and internal surfaces. A few were found on the neck, others on the crop. In several instances they extended well down the medial and posterior surface of the leg, as shown in figure 2. They had a tendency to appear in compact groups, though isolated cysts were not unusual.

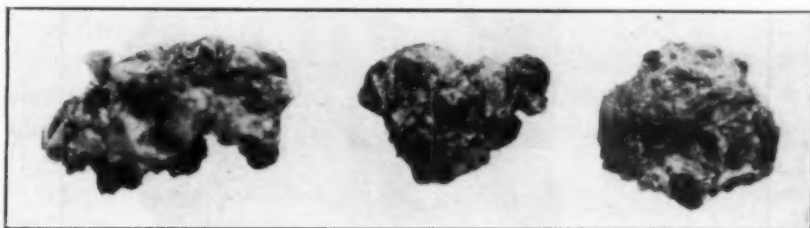


Fig. 2—Necrosed areas, consisting largely of groups of cysts of *Collyriclum* from abdominal region of poult. X3

The cysts were smooth and shiny, grayish-white in color, and varying in size from 2 or 3 mm. up to 10 mm. in diameter. Typically they showed a small black pore, as is apparent from the illustration. In older cysts there was a cap-like mass of black material, covering and surrounding this pore.

Frequently a mass of degenerating and necrosing cysts was noted (figure 3). These could be removed by gentle traction with the fingers or forceps. The surface area underneath was irregular, yellowish-white in color, as appears when necrosed or sloughed. This seems to be the method by which the infection is thrown off naturally by the bird. As will be seen later, it is also an important factor in the distribution of the parasite.

Following the examination of the turkeys, we attempted to get further data regarding the occurrence of this fluke in chickens. We first examined carefully a number of young chickens on the

same farm with the turkeys. We were surprised to find that there was no trace of the parasite to be found on any of them. Mr. Albjerg, who is a close observer, was confident that it did not occur on his chickens.

Later, we made a trip to the place where the infested chicken was found last year. Here again we found that the birds had been reared on the shore of a lake (Lake Minnetonka), under



Fig. 3—Cysts of *Collyricium* on leg of six-weeks-old turkey poult. Natural size.

conditions which were comparable with those under which the turkeys had become parasitized. The owner stated that the trouble had been noted in forty-six chickens. He was confident that there was no trouble this season. We were unable to examine any young chicks at this place, but we did examine several year-old hens that had been affected last season. In spite of the owner's belief that there was no trace of the trouble this season, we found several apparently fresh cysts on two of these hens.

On very carefully opening the cysts from the turkey, they

were found to contain two approximately hemispherical flukes, in contact by their flattened surfaces. They fill the cysts so tightly that unless special care is taken the worms are punctured when the cysts are opened. In such a case there exudes a dark brown, almost black, substance, which, on microscopic examination, is found to be made up of the minute, operculate eggs of the parasite.

While this striking parasite has apparently never before been noted for domesticated birds, it, or a very closely related species, is known to occur in various passerines. One of the writers has seen it on English sparrows at Ithaca, N. Y., and, in June of 1919, found it on an English sparrow at St. Paul, Minn. It has been reported by Cole (1911) for English sparrows at Madison, Wisc., and Ripon, Wisc. More recently Tyzzer (1918) has reported finding them, though rare, at Boston, Mass. "Three parasitized birds were found in the summer of 1915, and one each in the summers of 1916 and 1917, although several dozen birds were killed each season."

Stiles and Hassell (1908b) include the blue-jay (*Cyanocitta cristata*) among the hosts of *Monostoma faba*, the name then applied to this parasite. According to Cole (1911), this was based on a finding of the cysts by Dr. Hassell, in 1908, in Maryland.

One of us has found the parasite also in a young robin (*Planesticus migratorius migratorius*) taken at St. Paul in June, 1919. It is significant that both the blue-jay and the robin are distinctively American birds, as is also the turkey.

These seem to cover the records of such a parasite in this country. On the other hand, the American species has usually been assumed to be identical with one known in Europe since 1819. In that year, according to Jegen (1917), Prof. Fr. Meissner exhibited before the Swiss "Gesellschaft fuer die gesamten Naturwissenschaften" a finch (*Fringilla spinus*) which showed a number of spherical swellings which were regarded as *Cysticercus cellulosae* and were apparently not further investigated. In 1831 the contained flukes were described and figured by Bremser under the name *Monostoma faba*. It is by this name that they have been known in most of the subsequent literature.

In 1911, Kossack made a comprehensive study of the Monostome flukes, and established for Bremser's species *Monostoma faba* the new genus *Collyrichum*. Ward (1917) points out what he regards as specific differences between the European form,

as re-described by Kossack, and the material reported by Cole (1911). "The American form constitutes a new species, and to it the name *Collyriclum colei* may be given." Tyzzer (1918), who made detailed studies of the form found in sparrows at Boston, does not concur in this conclusion.

The European species, *Collyriclum faba*, has been the object of a detailed study by Jegen (1917). Through his own observations and through examination of the scattered literature, he lists sixteen species of birds found to harbor the parasite. These hosts were limited altogether to the passerine birds. Nowhere in the literature does there seem to be a suggestion of its occurrence on domesticated fowls.

Careful examination of our material, both in whole mounts and in sections, and comparisons with Tyzzer's descriptions clearly indicate that we are dealing with the same species as he. Whether it is identical with the European *Collyriclum faba* or no, we are not prepared to say.

The question naturally arises as to the original source of the infestation of both chickens and turkeys. Concerning the former we have no definite data. As already noted, the parasite has been found in a sparrow and in a robin at St. Paul, and, as no special effort has been made to find it before this summer, it may be fairly widespread in sparrows and other birds. However, careful inquiry among local ornithologists and taxidermists failed to reveal any knowledge of the infestation which is so conspicuous that it could hardly escape attention of those handling bird skins.

During the month of July, 1923, we examined upwards of a hundred sparrows, including fourteen nestlings, from the neighborhood of the two campuses of the University of Minnesota. No instance of infestation was found. There was no opportunity for examining sparrows from the region of the infested poultry on Lake Minnetonka.

On the other hand, we examined a dozen or more sparrows from the turkey runs at Vining without finding any cases. Subsequently, Mr. Albjerg continued examinations, and found two affected sparrows out of twenty-five shot.

So far as we could learn there were no other affected turkeys in the neighborhood, nor have we been able to learn of any other cases of the parasite on chickens in the neighborhood of the Minnetonka flock. The infestation is so striking in appearance that it hardly seems possible that it should wholly escape

notice if it occurs at all commonly in domesticated birds, handled as they are both alive and after killing.

It seems very strange that a veritable epidemic should appear in these two widely separated yards, if it is to be regarded as contracted indirectly from the ubiquitous English sparrow. This is, however, the most plausible explanation at present available.

That the development of *Collyriclum* is direct, as Jegen (1917) believes, seems altogether improbable. While he states that the eggs contain two embryos which in reality are young trematodes, we have seen the fully formed miracidium escape from eggs mounted in water. All of the evidence from the two epidemics which we have noted points to the belief that the life cycle of this parasite resembles that of the typical flukes.

For a period of some weeks the eggs, escaping through the pore in the cyst, are being scattered wherever the fowl goes. Moreover, the previously described necrosed areas (figure 3) slough off and with their myriads of eggs serve as an additional dissemination center. Washed into the nearby lake, the miracidia escape and continue their development, presumably in snails. The infective stage escaping from the mollusc probably encysts in the aquatic larva of some insect which is used, either as larva or adult, as food by the fowls. Studies must be made earlier in the season in order to obtain evidence on this point.

As to the effect of the parasite on the fowls, it is noteworthy that the owners of both flocks assured us that they could readily pick out the affected birds on account of their sluggishness and general unthriftiness. While Mr. Albjerg at first thought that the death of several of his poults was directly due to the parasite, there is no evidence that this was the case. We did not even see indications of discomfort, as manifested by pecking or clawing at the cysts.

In this connection it should be noted that the prevalence of the parasite in sparrows was brought to the attention of Cole because "Occasionally certain individuals in the flocks appeared reluctant to take flight, and when they did so their flight was heavy, as if the birds were in some way weighted down. Such individuals frequently lagged somewhat behind the others, and it was often with difficulty that they managed to alight even so high as the top of a fence." It was such birds that proved to be parasitized.

Quite apart from the effect, direct or indirect, on the bird,

there is no question but that the presence of the parasite would influence unfavorably the market value of poultry. This factor cannot be ignored.

Three of the affected poult were examined post mortem. The bodies did not show marked evidence of emaciation. The combs and visible mucous membranes of the head were apparently normal. The mucous membrane of the cloaca was pale. The feathers were smooth, long and rather oily and well set. The skin, aside from the presence of the cysts (location and description of cysts mentioned above), did not show any peculiarities. There were noted no gross lesions of the respiratory tract; heart and pericardium; oral cavity, pharynx, esophagus, crop, proventriculus or gizzard. In one, a small, raised, whitish-colored patch about 5 mm. in diameter was noted on the mucous surface of the ileum. Histologically, this proved to be a lymphoid hyperplasia (hyperplastic Peyer's patch). In the other poult, several tapeworms (*Metroliaesthes lucida*) were observed. The caeca and terminal parts of the intestine did not reveal gross changes. The contents of the alimentary tube seemed to be of normal amount, consistency and digestion. On the surface of one of the livers, four round, pale areas were noted (beginning necrosis). This was a significant lesion of infectious entero-hepatitis. No gross changes were noted in the spleens or kidneys of any of the birds examined.

A point of interest to be noted is the fact that none of the cysts was situated beneath a mucous membrane. The line of junction between the mucous membrane of the intestinal tract and the epidermis marked the limits of the cyst invasion.

PREVENTIVE MEASURES

A study of the conditions under which infection occurred, and under which certain broods on the same farm escaped parasitism, clearly points out the line of effective prevention. In view of the apparent rarity of the trouble, it is hardly to be supposed that such suggestions need be followed merely as a precautionary measure. Where the infestation is established, or where it occurs in neighboring flocks, the importance of preventive measures is obvious.

The young birds should not be allowed access to lakes, ponds or similar bodies of water.

They should not be allowed to range through marshy meadows which may possibly harbor intermediate hosts of the fluke.

Attention should be directed to the possibility of eggs of the parasite being washed by rains or carried by natural drainage into bodies of water where they may continue their development. Where feasible, measures should be taken to prevent this.

Since it is highly probable that the infection is spread by the English sparrow, we have an additional reason for attempting to eliminate this feathered pest.

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A COMPOSITE ANIMAL

The town of Yale, Mich., boasts an animal that has the face of a fox, the fur of a cat, and the bark and habits of a dog. This animal was crossed with a terrier, and two puppies(?), two weeks old, were recently shown at a poultry show, held in Detroit.

FOX INDUSTRY GROWING

Between 18,000 and 20,000 silver black foxes are undergoing the process of domestication in America. The fox-ranching industry represents an investment of more than \$12,000,000, according to latest reports. It is estimated that there are 600 fox farmers in the United States.

WORTH REMEMBERING

The value of time.
 The success of perseverance.
 The pleasure of working.
 The dignity of simplicity.
 The worth of character.
 The power of kindness.
 The influence of example.
 The obligation of duty.
 The wisdom of economy.
 The virtue of patience.
 The improvement of talent.
 The joy of originating.

SWINE DYSENTERY

By R. A. WHITING, *Lafayette, Ind.*

Perdue University Agricultural Experiment Station

For the past six years the Veterinary Department has received a number of requests from veterinarians and farmers to give assistance in the control of outbreaks of dysentery in swine. This disease is commonly known among stockmen as "bloody diarrhea," because of the bloody appearance of the excreta; and "necrotic enteritis" among veterinarians, because of the necrotic condition of the mucosa of the large intestine, found on autopsy of well-advanced cases of the disease. All outbreaks are sporadic.

Our investigation of early outbreaks indicated that the cause of the disease was a specific infection. At that time traffic in stockyard feeder hogs was unusually heavy, and practically all outbreaks were traceable directly to car shipments from public stockyards. Always a few hogs were noticed affected soon after the shipment arrived on the premises, and within a few weeks the infection would become general. Later, the breeding herd would become infected. The following brief description of herd outbreaks are quite typical of this disease.

Two hundred forty feeder hogs were purchased in stockyards. When the hogs were brought onto the farm, a few were scouring. Fifteen days later, fifty of the hogs had died, a number were sick, and a few seemed to have recovered completely.

On this same farm, the breeding herd was pastured in a field some distance from the feeding hogs. Sixty days after introducing the infection on the premises, the disease broke out in this herd. The sows recovered, but fifty per cent of the pigs died. The following spring these sows farrowed 130 pigs. Two of the sows and practically all of the pigs developed dysentery, and fifty per cent of the pigs died. The sows were moved to new quarters, and in the fall farrowed 90 pigs. About weaning time the disease again appeared in the fall pigs. The death-rate was about the same as in previous outbreaks. Mixed infection bacterins were given, without any favorable results. All of the pigs received anti-hog cholera serum and the sows had been vaccinated. Sanitary conditions were above the average.

Two weeks after a car-load of stockyard feeder hogs was placed in the feed lot, the owner noticed that a number of them

were sick and scouring. Thirty days later the disease appeared in the breeding herd. In this outbreak one brood sow died, and fifty per cent of the young pigs. The disease remained on the farm, affecting successive crops of pigs for several years. None of the brood sows showed symptoms of dysentery after the first year.

Feeder hogs were purchased in two of our large stockyards, three car-loads in all. Ten days after they were unloaded, the owner reported that a number were sick and scouring, and about two weeks later 120 were sick and 40 had died. The well hogs were marketed, and the sick ones were changed from the feed lots to a large pasture, and fed very lightly. They continued dying for about ten days, when the remaining hogs showed rapid and marked improvement. Autopsies did not show any cholera lesions.

A farmer purchased six feeding shotes. Two had a dark-colored diarrhea which the former owner attributed to the feeding of tankage, for the reason that when tankage was withheld, the diarrhea practically disappeared in the herd. The six hogs were placed in feed lots with 125 hogs that were healthy and had been raised by the owner. About one week later one of the feeding hogs sickened and showed typical symptoms of dysentery. In the course of a few weeks nine had died, and the others were sick or had made a good recovery. There were about 50 young pigs running in adjoining lots. A few of these pigs crawled through the fence into the feed lots, became infected, and carried the disease to the breeding herd. Twenty-nine pigs died. Early in the outbreak the sows were isolated and escaped infection.

In this outbreak the first hogs became infected from the herd getting into neighboring yards and feeding around a manure pile from a pen of dysentery pigs. The owner of the herd from which the original infection came was not acquainted with this fact when he disposed of the six hogs.

SYMPTOMS AND POST-MORTEM LESIONS

Early in the outbreak, a small percentage of the herd is sick. The symptoms are slight fever, slowness in moving about, standing with the head down or lying on the sternum, diminished appetite, and twitching the tail. The body temperature becomes normal about the time that the diarrhea begins. The diarrhea varies in color, depending on the character of the feed. It is

usually mixed with more or less blood and mucus, and in typical cases becomes red or "tomato-colored." If the sickness is prolonged, the emaciation is marked, and the animal becomes very weak.

The duration of the disease varies from a few days to about two weeks; in mature hogs the course is short. In young hogs the recovery may be incomplete, the animal becoming stunted or unthrifty.

In pigs the death-rate varies from 40 to 60 per cent; feeder hogs from 10 to 20 per cent; and in brood sows from 2 to 5 per cent. The general average is about 25 per cent.



Fig. 1—Young hog showing physical symptoms of dysentery.

The disease is chiefly an infection of the cecum, colon, rectum, and stomach. The small intestine is rarely involved, and then only to a slight degree. In the early stage the pathological changes consist of blood engorgement and hemorrhages of the colon mucosa. Later there is an abundant mucous exudate streaked with blood. Diphtheritic plaques that resemble small particles of fibrous alimentary substance occur on the surface of the mucosa. In the last stage of the disease, diphtheritic, necrotic and ulcerative lesions are quite evident. The necrosis and ulceration may extend to the submucosa, or even to the muscular coat.

MICROSCOPIC LESIONS OF STOMACH AND COLON

Sections of the stomach in early stages of the disease show a well-marked hyperemia, extravasations of blood in the superficial portion of the mucosa and some desquamation of the epithelium. Later a necrosis may occur, involving nearly the entire thickness of the mucous membrane.

Sections of the colon taken early in the disease occasionally show an exudate on the surface of the mucous membrane, containing many polynuclear leucocytes. Usually, the material on the mucous surface consists of mucus, fibrin, bacteria, lymph-



Fig. 2—Mucosa of colon showing diphtheritic plaques and membrane, and slight ulceration

oid cells, desquamated epithelium, and red blood cells. In the mucosa the blood and lymph vessels are engorged, and there is considerable extravasation of blood, especially in the portion near the lumen of the colon. Just beneath the intestinal epithelium there is usually a well-marked edema. Scattered masses of blood may be present on the surface of the mucosa. At such points the epithelium is destroyed or pushed away from the mucosa by the extravasated blood. The epithelium of the crypts shows numerous goblet cells. Occasionally the submucosa is edematous and hemorrhagic. The diverticula of the

mucous membrane in the submucosa show changes, both in the epithelium and in the mucosa, similar to those occurring in the mucous membrane along the lumen of the colon. The lymphoid tissue surrounding these diverticula may be hyperemic



Fig. 3—Mucous membrane and submucosa of colon showing exudate on mucous surface, hyperemia and hemorrhages in mucosa and submucosa

or hemorrhagic. A marked leucocytic infiltration of the colon wall is seldom observed.

Sections of the colon taken in a later stage of the disease show a well-marked catarrh and continuation of the hyperemia. The

blood vessels, especially of the mucosa, are engorged and many show thickened walls. The intestinal epithelium is practically all gone, and a layer consisting of fibrin, bacteria, mucus, and



Fig. 4—Mucous membrane and submucosa of colon, showing diphtheritic membrane and necrosis, atrophy of cryptic epithelium and some leucocytic infiltration of submucosa.

cell detritus covers the mucosa. The crypts are distended with mucus, and the epithelium of the crypts atrophied.

Sections of the colon taken in a still later stage of the disease show necrosis extending inward from the surface of the mucosa.

The width of this zone of necrosis may be fairly uniform, or it may be decidedly variable, frequently it dips down to the submucosa and includes a part of it. Beneath the zone of necrosis there is usually a hyperemic and hemorrhagic zone. Thrombosis of the blood vessels in the mucosa and submucosa may be noted.

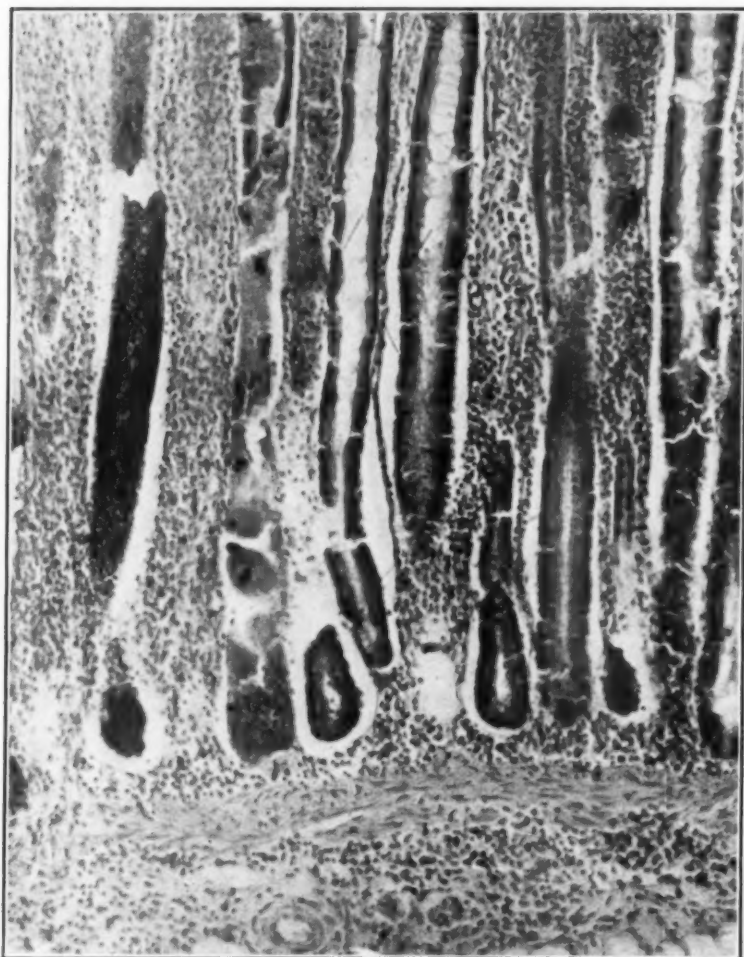


Fig. 5—*Balantidium coli* in crypt of mucosa

Another conspicuous microscopic feature of the colon is the presence of *Balantidium coli*. Parasites occur commonly in the exudate on the surface of the mucous membrane and occasionally in the mucosa, especially if the tissue is damaged. They are not considered etiologically significant in dysentery.

SUMMARY OF EXPOSURE AND FEEDING EXPERIMENTS

Blood obtained from the early outbreaks was injected intramuscularly and intravenously (3-10 cc), and fed (70-100 cc) to non-vaccinated pigs. All of the pigs remained well for 20 days, when they were exposed to the disease and proved susceptible; those pigs that recovered were exposed to hog cholera and died, thus proving the distinctness of the disease from hog cholera.

Colon contents or feces were collected from several different outbreaks that were proved to be dysentery. This material was fed to 28 healthy pigs; 21 of the pigs developed the disease in from 5 to 28 days after eating the contaminated feed; 7 remained well, although 4 of these developed the disease when the feeding was repeated. Three pigs in one experiment did not develop the disease.

The viscera, except the small intestine, of four typical acute cases of the disease were fed to three lots of eight to ten pigs, each lot being divided into four groups. The hearts, lungs, livers, spleens, and kidneys were fed to lot 1; the stomachs to lot 2; and the caeca and colons to lot 3. Following the four feedings of hearts, lungs, livers, spleens, and kidneys, all of the pigs remained well; they were then exposed to dysentery and proved susceptible. Of the four groups of pigs fed stomachs, one group developed the disease and three groups remained well. The pigs in two of these groups proved to be susceptible upon exposure to the disease, while the susceptibility of the other group of pigs could not be determined. Each of the four groups of pigs that were fed the caeca and colons developed the disease. The pen control pigs remained well for about ten days after the other pigs began to show symptoms.

VARIATION IN PERIOD OF INCUBATION

Variations of the interval of time between the possible introduction of the virus of dysentery and the development of initial symptoms depended upon the methods used, whether infectious material was fed or whether the hogs were given pen exposure. Usually greedy hogs, or those fed a liberal quantity of virulent material, had shorter incubation periods than hogs which had received rather limited quantities of material or had been given pen exposure.

The earliest observation of visible symptoms in the different groups of hogs was as follows: Feces or colon contents were

fed to 28 hogs; 25 developed symptoms in from 5 to 18 days. Colons or sections of colons were fed to 34 hogs; 25 developed symptoms in from 7 to 18 days. Of 130 hogs given pen exposure, 117 developed symptoms in from 5 to 39 days. In the cases of the long incubation periods, where the hogs were given pen exposure, there actually occurred one or more active exposures within that time, as fresh cases were more or less constantly developing.

Naturally, of two exposed pigs, the one which ate its feed greedily or consumed the infectious material readily, received the greater degree of exposure and sickened first. Of the 192 pigs exposed to the disease by feeding, or pen exposure, 176

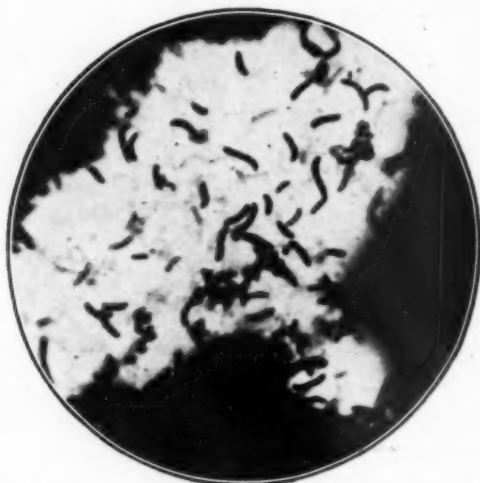


Fig. 6—Comma-shaped micro-organisms in section of colon, stained with silver nitrate (Warthin-Starry method). In this portion of crypt these micro-organisms predominated.

(87 per cent) developed the disease, while 25 (13 per cent) did not show visible symptoms. All of the pigs that did not develop the disease were later fed virulent material and remained well.

CULTURE FEEDING EXPERIMENTS

Cultural inoculations from heart-blood, lungs, liver, spleen, and kidneys of acute cases were usually sterile. Similar inoculations from the less acute and chronic cases resulted in the isolation of a number of different bacteria. Arranged in the order of frequency of isolation from the tissues these were: *B. suispestifer*, *B. coli*, *B. paracoli*, *B. pyocyaneus*, *B. alcaligenes* and *B. suissepticus*.

Feeding experiments with 50-150 cc pure culture of each of the non-paratyphoid bacteria gave entirely negative results. Feeding experiments with *B. suispestifer* (50-150 cc) showed it to be pathogenic. Nine strains of *B. suispestifer* isolated from different outbreaks were fed to nineteen pigs. All showed at least some evidence of illness, and six died after showing high body temperatures, loss of appetite and diarrhea. Of thirteen control pigs, three became sick and two died.

The culture-fed pigs were fed in separate pens, and moved from one to three hours later to pens that contained the control



Fig. 7—Micro-organisms in section of colon, stained with silver nitrate (Warthin-Starry method). In this portion of crypt these micro-organisms predominated

pigs. The diarrhea that occurred subsequent to feeding *B. suispestifer* was never bloody. Those pigs which died showed extensive necrosis of the gastro-intestinal mucosa, congestion of the visceral lymph glands, and in some case hemorrhages of the lungs and purplish discoloration of the skin. Nineteen of the surviving pigs were later exposed to dysentery on an infected farm. Practically all of them developed the disease.

Cultural inoculations from dysentery feces and colon walls showed a preponderance of *B. coli*, together with paratyphoid-enteritidis variants, *B. necrophorus*, vibrio-like bacilli, spirochetæ and amoebæ. *B. suispestifer* could not be isolated from the feces.

B. necrophorus cultures were obtained by inoculating rabbits with scrapings from the colon mucosæ of dysentery pigs and transferring to anaerobic media. Several pigs, which were fed

cultures of from 10 to 20 grams of the rabbit-ear abscesses, remained well from 16 to 20 days, when they were exposed to dysentery and developed the disease. Similar results were had in feeding cultures of amoebae and spirochetæ.

SUMMARY

This disease presents all of the characteristics of dysentery.

It is a distinct infectious disease of swine, introduced into sections, where sporadic outbreaks were investigated, by stock-yard feeder hogs.

It may be reproduced by feeding feces, stomach tissue and contents, and large intestine and contents, from dysentery swine that show acute symptoms or that have died.

B. A. I. HISTORY TO BE PUBLISHED

On another page in this issue is the official announcement of the publication of a history of the Bureau of Animal Industry, in connection with the marking of the fortieth anniversary of the organization of the Bureau, in May. Every veterinarian should have a copy of this book in his library. If three thousand copies are sold, the cost per copy will be only one dollar. If a less number are ordered, the price will be higher. Keep the price down by sending in your order. (See page 682.)

AIREDALES HOLD THEIR OWN

American Kennel Club registrations, the most reliable barometer in dogdom, do not show a falling off in Airedales, as many believe.

The shepherds still hold the lead, of course, with 26 pages of registrations. Boston terriers come next with 19 pages, and the Airedales third with 14 pages, the latter representing about 630 dogs.

REGULAR WAR HORSE

A farmer sold a horse to a cavalry officer, warranting the animal to be a first-rate war horse. Some time afterward, the officer came to the farmer in a rage and said: "You call this animal a good war horse? Why, there's not a bit of go in him! A good war horse, indeed!"

"So he is," replied the farmer. "Sure, he'd rather die than run."—*Pittsburgh Chronicle-Telegraph*.

HONESTY OF PURPOSE¹

By HARRY GIESKEMEYER, *Fort Thomas, Ky.*

President of the Kentucky Veterinary Medical Association

Honesty of purpose—that is the real keynote of success for any veterinarian, no matter what part of the profession he follows. To practice veterinary medicine is, first, to know intimately the profession you are representing. I stress this first, because it is the all-important point in building a practice. You can not study your profession too closely. You can never know all about it, no matter how much you think you know. Devote yourself to a careful, rigorous knowledge of your profession. Thus equipped you will be keyed up to a quick response in your come-back arguments. Believe in what you represent; if you do not, drop the profession and take up something else. You can not practice a profession in which you can not convince your inner self that it possesses the very highest merit. That is half the battle.

But, let me caution you, you must use all the tact within you, and character analysis in selecting your come-back arguments which you have stored within your reserve, and change the wording of expression according to the analysis of the client you are trying to represent. You can not qualify too strongly in character analysis. Read everything you can get your hands on along character analysis, and apply it to your practice.

We have all heard the time-worn remark: "Veterinarians are born, not made." I never will agree with that statement. I have worked against men, and with men, who, by all the rules of the game, should have been classified as born veterinarians, and men who, on first meeting them, would give any person that impression—men in whom one could put absolutely full confidence—men with a gift of words quite unique, yet, I have seen dozens of such men fall by the wayside.

Why? Because they thought they were "born veterinarians," and as such, feeling their superiority over the rest of us poor mortals—we hard-working, every-day pluggers, they were overconfident, and talked themselves in and out of a practice. A practice that is in and out, you will agree with me, is usually

¹Read before the Kentucky Veterinary Medical Association, Lebanon, Ky., July 25-26, 1923.

OUT; so is the veterinarian who uses the poor judgment of permitting this to happen.

That is why I say that, although veterinarians may be born right enough, they have to be made over into real articles by hard work and study before they are really useful. The "born veterinarian," the self-conceited sort, usually finds the short route into the discard; while the hustling, every-day plugger—the man who knows he has to dig for his practice and qualifies himself for his work by studying his profession—gets intimately acquainted with character analysis, and goes after business scientifically, the man who knows no certain hours in which to do his practicing, the man who can sell himself before he attempts to sell his professional knowledge to others, as a rule gets where the "born veterinarian" would like to get, but never lands. The hard-working veterinarian has no time to kick and dictate and make himself a nuisance. It is only the "born veterinarian" who knows more than anybody else, and who does not think it necessary for him to study veterinary medicine in every branch that applies to practice.

Personally, I have had as many ups and downs as any man. But I have always held before me one motto, and have had a good many hard spills with it in my possession, yet I hung on to it through all. When I was a boy my mother would frequently say: "Son, whatever you do, do the best that's in you. Never admit that it can not be done. Go out and do it."

When calling on a client ever bear in mind that you are just as big a man as he is; that you are not asking a favor, but extending one, by letting him have your knowledge.

Keep up your appearance. To be successful, you must look successful. Be sincere, and, above all, get your memory to work well. Remember the man's name, repeat it frequently in your talk to him. It is insidious flattery to call a man by name—it is showing a direct personal interest in him which he appreciates—it brings you into closer personal touch with him. You can get more out of a clam by flattering it than by ignoring its vanity. Every human being likes to be prominent enough to have his name stand out.

Money, money, money—dollars and cents. We are measuring things by money. We measure the worth of men by money, and I am not talking to a bunch of millionaires, but, if I were, I would not say anything else, nor have I ever failed to say it. Money is the greatest curse of the whole universe, but when

we have understanding, then the desire to do good to the other fellow is the compensation. Money is simply a means of exchange.

Thus is my problem solved in the measure that I give service unto you. That is why I am more interested in you than in any other phase of the personnel that means so much to this organization. Without a veterinary organization we can't go on. We must market our services, and we can not get along without veterinarians. We must fit into one another, we must stand for our policy—the policy of doing right. You veterinarians are the forerunners of our profession, the message of what this organization stands for, and the live stock breeders must be thoroughly sold on this policy.

Veterinary medicine must be based on honesty of purpose. I wish to show you how the veterinarian stands in the eyes of the world; to define more clearly the greater force the veterinarian has with honesty of purpose behind him. Individuals, no matter who they are, men, women or children, in all of their steps, sell themselves to others. We are all selling or advancing something good or something bad; we are either constructive veterinarians or destructive veterinarians; we are either part of the positive class or on the negative side.

A veterinarian who goes out as a negative veterinarian has little value or force, and therefore never amounts to anything. When a veterinarian lacks positiveness he is devoid of power, and fails to convince and impress others. The man who is positive knows what he is talking about, he knows what he is doing, and, therefore, has convincing power to bring others to his viewpoint. It is written: "Ye shall know the truth and the truth shall make you free." It is quite clear that no man is free nor is he comfortable in his own conviction unless he knows the truth about the thing with which he deals.

The high standard of veterinary medicine is based on truth. I can well remember the time when most "horse doctors" that I came in contact with were gigantic liars and were working on the wrong basis. Such practice is fast becoming a thing of the past.

Now for a little individual thought as to what veterinarian means. Do you know there is no vocation that means so much to man? I know of no greater collective force for the spreading of advance thought to civilization than the force represented by veterinarians! He has the greatest field imaginable for the

spreading of good, and plays a large part in the educational endeavor and, therefore, should fully realize his responsibility in spreading at all times a truthful message.

I want to say that if this assembly here today will go out with the full determination of doing what we are talking about, we can convert the State of Kentucky, yes, the whole United States, into using better veterinary service, right from this little gathering.

There is only one thing lacking, and that is to get down to the fundamentals, the foundation stone of success: Honesty of purpose. We can progress into the more sublime and more successful surroundings only when we base all that we do on honesty of purpose.

I want you men to keep this idea in mind from now on; that we are going out, determined never to lie, never to misrepresent anything, whatsoever; that we will spread the gospel of truth about all things, and that we will go out to do the greatest measure of good to the greatest number.

Veterinary medicine is not a plodding drudge; on the contrary it is a lofty occupation, it is among the headliners in professional pursuits.

You can always tell what kind of a man you are going to meet when you look into his place. Men express exactly what they are by what they say and do, how they dress and live, and the order in which they conduct their place, for it is written: "By their works ye shall know them."

The simple thing to do is to become students of what you are doing. What is your biggest asset? What is the biggest asset man has, personally? Study the man you come in contact with, judge him through your observation, always have in mind to lift him up and to benefit personally by the good he reflects, either to take it all and use it as an improvement of your own conduct or to improve him by your advance knowledge of better things. Remember that you can not help the fellow that will not help himself, nor can you improve if you are not receptive and desire better things.

We live in the universal force of knowledge and betterment, and it is up to us to adjust ourselves to it. The understanding of this great fact will make you a force for good among men.

The world needs more men who realize their responsibility for doing the greatest good. What is needed everywhere is men of conviction and unselfish service. The veterinary profession

needs just that sort of men, needs more leaders, more pioneers in promoting one of the greatest factors in home life for the betterment of conditions of health and comfort, which in turn will reflect the greatest harmony into every phase of social, industrial and business life.

Stimulate your efforts to become leaders, go out and give those with whom you come in contact an inspiration from the new message of the power of honesty of purpose. Live it and act it, in everything you do.

Remember that men are alike in every territory no matter where you may go, you will find that men practice all of the traits that you might in any other place. Your field, therefore, is large, and it is up to you to be busy about the biggest business of doing the greatest amount of good for the benefit of the greatest number. I am absolutely confident that each of you has the same force about you and among you, and that each one of you has the power to get into the understanding of the message that you want to give out.

A FINE COMPLIMENT

In the December number of the *Military Surgeon* there was printed a special dispatch to the *New York Herald*, from Havre, France, in which the French army surgeons paid a very high tribute to the American military service, after the visiting surgeons had attended the American Army Surgeons' Association Congress, at Carlisle, Pa. The dispatch went on to say that Professor Charles Porcher accompanied the French army surgeons on their return trip. The dispatch referred to Professor Porcher as one of the greatest European authorities on milk, and he was quoted as having said that America has the best milk in the world. Following his attendance at the Montreal convention of the American Veterinary Medical Association, Professor Porcher attended the World's Dairy Congress and later the meeting of the International Dairy Association, in Seattle, Wash.

PLEGGED TO USE PUREBREDS

Farmers who have joined the Better Sires—Better Stock campaign, and by so doing pledged themselves to use only purebred sires of any kind on their farm, now number more than 12,000, according to the latest figures published by the United States Department of Agriculture.

THE CONTROL OF RABIES¹

By JOHN REICHEL, *Glendolden, Pennsylvania*

The control of rabies is a task that centers itself in the prevention and treatment of the disease in dogs and chiefly in dogs actually bitten by rabid animals. Exposure invariably consists of a wound inflicted by a rabid animal, and anything less might very well be regarded as no exposure at all. In fact, the only form of exposure that need be seriously considered in this disease is the bite inflicted by a rabid animal. Dogs which have been with a rabid dog, but have not been wounded by it, have not actually been exposed. Unfortunately, however, it is not always possible to know all dogs that have been bitten in a given outbreak. It is, therefore, best to assume in the control of the disease that more than the dogs known to have been bitten have been so exposed, and to enforce strict quarantine measures.

The most important problem in the control of rabies is the disposition of the bitten or exposed dog. The destruction of the animal, while an effective method, is not one that can be carried out in each instance, and therefore the question arises—can such an animal be protected from the development of the disease, thereby saving the life of the animal and preventing others from being exposed? This procedure, however, is complicated right at the beginning, inasmuch as the infected dog may have been bitten unobserved or in such a manner as to leave no appreciable wound. Therefore, precautionary measures, as required for infected animals, should be applied to all dogs in a given locality to make certain that any dog that might prove a menace later is taken care of.

The control of rabies depends entirely upon the application of any one of the three following procedures:

1. Destruction of all dogs in a given area, suspected of having associated with a rabid animal.
2. Individual quarantine over a period of not less than 100 days.
3. Protective immunization.

The effectiveness of the first two procedures has been established when properly carried out; but in both the welfare of the dog is sacrificed to such a point that owners object. Destruction

¹Summary of remarks made at the fortieth annual summer meeting of the Illinois State Veterinary Medical Association and the Fourth University Veterinary Conference, Urbana, Illinois, July 12, 1923.

of the dog ends the problem, but muzzling, with and without quarantine, only prevents the spread of the disease. It in no way reduces the chance of the development of the disease.

Protective immunization, if effective, saves the dog and eliminates the possibility of its spreading the disease. This is best assured by the use of a *killed* rabies vaccine which in itself is incapable of infecting any animal injected.

Experiment No. 127¹ dealt with the problem: "To determine whether or not a 'dead' or non-infective vaccine was equal to a 'live' or infective vaccine as an immunizing agent in the single-dose treatment," and it was shown that

"1. 'Dead' rabies vaccine, in the single-dose treatment used, can be said to have immunized and protected, since (1) five out of the twenty treated dogs remained alive for more than 100 days after the injection of 'street virus'; (2) only one out of the twenty treated dogs developed rabies after the injection of 'street virus'; (3) all nine untreated dogs developed rabies after the injection of 'street virus.'

"2. To avoid a high percentage of accidental deaths in an experiment of this sort, the dogs should be kept in individual cages, properly housed and carefully rationed.

"3. A clinical diagnosis of rabies must be supported by the results of the subdural injection of two rabbits with the brain emulsion of each dog."

In this experiment the dogs were injected with 'dead' rabies vaccine on June 23, 1922 and injected with the infective dose of live street rabies virus on September 23, 1922, three months later.

Well controlled experimental data are needed to support the claim that any form of rabies vaccine treatment is effective following natural or artificial infection with virulent virus. Experiments are underway at this time, with sheep and dogs, in which all of the animals are injected intra-ocularly with live street rabies virus, and then treated with an injection of dead rabies vaccine, single-dose treatment.

It has been amply shown, as borne out by Experiment No. 127, that dogs can be immunized with dead rabies vaccine, in the single-dose treatment, sufficiently to protect them against infection three months later. General protective immunization of dogs in a given locality can therefore be recommended on a

¹Rabies Vaccine Canine. Single Dose Treatment. John Reichel and J. E. Schneider. Jour. A. V. M. A., LXIII (1923), n. s. 16, 1, p. 83.

sound basis. The single injection of dead rabies vaccine has proved to be sufficient.

When an animal is infected with virulent street rabies virus, through a bite of a rabid animal or otherwise, the animal immediately starts on the period of incubation of the disease, which may vary from ten days to as long as a year. In the shorter periods the virus apparently travels quickly from the site of infection to the central nervous system, and inasmuch as the rabies vaccine requires considerable time to immunize, the infection proceeds and the animal develops rabies without even the period of incubation being affected. Therefore, the shorter periods of incubation are of greater concern in the control of rabies by protective immunization with dead rabies vaccine single-dose treatment than the long periods.

Protective immunization in the control of rabies should include the prompt injection of all dogs, and those known to have been bitten placed under quarantine for at least thirty days. It has been our experience that dogs infected and then injected with dead rabies vaccine single-dose treatment, will not develop rabies if they survive thirty days of the period immediately following exposure.

Dead rabies vaccine, including 2.5 to 3% total solids in a 5-cc dose, is ample for any dog regardless of size, and not too much for the smallest. The amount of material in such a single-dose treatment is practically equivalent to the amount included in the multiple-dose treatments of six or more injections. The success of any form of rabies vaccine treatment depends largely on the shortness of the period between exposure and injection, and the immunizing value of the single or initial dose. Therefore, if the single dose includes a sufficient amount of material to protect, additional doses, while they may add to the protective immunity, are in reality of little or no practical value.

Briefly summarized, the control of rabies is possible by protective immunization when 5 cc of dead rabies vaccine, with 2.5 to 3% total solids, are injected into each dog quickly enough after exposure, and when those known to have been bitten are kept under observational quarantine for a period of at least thirty days.

Modern methods of killing whales threaten extinction of the great sea-mammals in southern waters. They have nearly disappeared from the waters of the North.

THE LATEST METHOD IN THE CONTROL OF CHICKEN POX AND ROUP BY VACCINATION¹

By J. W. FULLER, *Ithaca, N. Y.*

Chicken pox in the last few years has caused more financial loss among poultrymen of New York State than any other disease of adult fowls. The loss is not only in birds that die from the disease but a decreased egg production at the time of high-priced eggs and weakened chicks hatched from hens that have been weakened by a severe case of chicken pox. Chicken pox vaccination in New York was started at the request of some poultrymen who had had such severe losses from chicken pox that they feared they would be forced out of business.

HISTORY

Although chicken pox has been known for a great many years, it is only recently that vaccination has been tried.

Following is a brief description of the methods used:

1. Drying and grinding in a mortar chicken pox scabs and cankers. These are then mixed with physiological salt solution and bile from diseased chickens and heated in a water bath at 55-60° C. for one hour. The mixture is then strained through sterile cheese-cloth, to remove the coarser particles, into sterile bottles. One cc (mil) of this is injected under the skin of the breast at three- to five-day intervals.
2. Same as no. 1, but omitting the bile.
3. Inoculating a chicken on the tip of the comb with chicken pox and cutting the lesion off on the tenth day.
4. Heating chicken pox scabs at 100° C. for one to two minutes and pouring off the clear fluid. This is injected under the skin of one side of the breast followed by an injection in five to eight days on the other side.
5. By using only the scabs that form on the comb prepared and used the same as in nos. 1 and 2.
6. Avian mixed bacterin. Several strains of bacteria are isolated from discharges from the nose, eyes or mouth of birds suffering from roup. The bacteria are grown on agar in a bacteriological incubator at 37.5° C. for twenty-four to forty-eight hours. They are then washed off with physiological salt solution which is 0.5% carbolic acid and heated for one hour at 55-60° C., and cooled on ice or in running water. The mixture is then filtered through sterile cotton into sterile bottles. One cc is injected under the skin of the breast at intervals of three to five days, usually three injections are sufficient.
7. A mixture of five and six are used. As no. 5 has been used most extensively, the technic of its preparation will be given in detail.

TECHNIC

The vaccine is prepared from tumors taken from the combs of cockerels or cock birds artificially inoculated with chicken pox. Combs of healthy cockerels or cock birds are moistened with a suspension in sterile water of dried, ground, chicken pox tumors or tumors taken from fresh cases of chicken pox. The comb is

¹Read before the Annual Poultry Convention, Amherst, Mass., July 25, 1923.

then vigorously scarified with a dull knife until the blood shows on the surface. Both sides of the comb are used. The tumors are ready to remove in from three to four weeks after inoculation. After removal, they are dried for twelve to twenty-four hours in a bacteriological incubator, kept at a temperature of 36-37° C., ground in a coffee mill, then in a ball mill for twenty-four to seventy-two hours. If perfectly dry, this powder will keep for months and should be stored in dark-colored, sterile bottles until needed in the preparation of the vaccine.

One gram of the powdered, desiccated virus is placed in a sterile mortar with a sufficient amount of sterile salt solution to make a paste and ground until the mixture acquires a smooth, cream-like consistency. To this mixture is then added sufficient sterile salt solution to bring the volume up to eighty cubic centimeters. It is then poured into a sterile flask or bottle, placed in a water-bath and heated at a constant temperature of 55° C. for one hour. It is then filtered through sterile cheesecloth into sterile bottles and to it is added twenty cubic centimeters of sterile salt solution containing 1% of phenol for a preservative. It is now corked with sterile corks and placed in cold running water or on ice until cooled.

METHOD OF ADMINISTERING THE VACCINE

The vaccine is administered by injecting it beneath the skin of the breast under the right wing with a hypodermic syringe. The dose is one cubic centimeter. An assistant should hold the bird. Both wings are held with the left hand and both legs with the right hand. The bird is then placed on a table on its left side, with its breast toward the operator. The skin should be cleansed with a 2% solution of pine oil or other good antiseptic, picked up with the thumb and forefinger of the left hand and the needle inserted with the right hand. The dose is injected and one finger placed over the needle wound as the needle is withdrawn, and the area gently massaged. The needle best adapted for this work is a 16- or 18-gauge needle at least an inch and one-half long. Care must be taken to keep the vaccine well shaken while using. One cc of vaccine is used.

From February, 1921, to May, 1923, inclusive, a total of 72,315 doses of vaccine were used against chicken pox and roup.

RESULTS

Chicken pox vaccine.—In the winter and spring of 1921, 2600 birds affected with chicken pox were given one dose (1.0 cc).

Of these 2200 (80.4%) recovered shortly after vaccination and showed a marked increase in egg production. In 400 (19.6%), there seemed to be no improvement. These 400 birds had less than two square feet of floor space per bird and were heavily infested with large round-worms and tapeworms.

In the fall and winter of 1921 and 1922, 5343 birds were vaccinated with one dose before chicken pox appeared. No cases of chicken pox developed in these flocks. In infected flocks, 10,185 doses were used as a curative, one dose being given. No new cases developed and all but the very worst cases recovered.

In the fall, winter and spring of 1922 and 1923, 34,585 doses of the vaccine were used, one dose being given. A report was received on 21,759 doses or 62.6%. Of these, 11,900 doses were used as a preventive. Of these, 8100 (68%) remained free from pox, 2600 (21.8%) had light cases of chicken pox, while 1200 (10%) developed bad cases of chicken pox. There were 9,859 doses used as a curative. In 6759 (68.3%) the spread of disease stopped and diseased birds recovered in from one to two weeks after vaccination. In 3100 cases (31.7%) there seemed to be no improvement.

Avian mixed bacterin.—In the winter of 1921-1922, 1000 doses were used in flocks affected with watery noses, bad eyes and cankers of the mouth. All reported good results. One cc was injected subcutaneously.

In the fall and winter of 1922-1923, 13,850 doses were used. Only 4551 (32.8%) of these were reported on. All reported favorable results.

Mixture of chicken pox vaccine and avian mixed bacterin.—In the winter of 1922-1923, 3960 doses of the mixture were used in infected flocks. One cc was given, one dose being used. All except the very worst cases recovered in one week and no new cases developed.

One flock of sixty hens affected with chicken pox was vaccinated with one cc of the chicken pox vaccine. One week later they were given one cc of the avian mixed bacterin. Five days later they were given another dose of avian mixed bacterin. All recovered shortly after the last vaccination.

CONCLUSIONS

1. Chicken pox vaccine has both a preventive and curative action. One dose of one cc should be given at about the time pullets go into laying quarters in the fall, in localities where

chicken pox is known to exist. As soon as chicken pox is noticed in a flock, the entire flock should be vaccinated with one cc and the worst cases removed and vaccinated every third or fifth day with one cc and treated locally.

3. Flocks that have both roup and chicken pox should be given a mixture of the chicken pox and avian mixed bacterin or should have one dose of chicken pox vaccine followed by one or two doses of avian mixed bacterin at three- to five-day intervals.

3. Flocks that are heavily infested with worms or are overcrowded do not respond so readily to vaccination against chicken pox as do flocks that are properly housed and free from other diseases.

HERE AND THERE

Animal interference with telephone service includes bears that mistake the humming of wires for a swarm of honeybees; squirrels that chew holes in the lead sheath of cables; ants and beetles that eat metal, and spiders that throw their webs across open wires, causing short circuits when dew gathers on the web.

A honeybee's work consumes about half the hours of daylight, the remaining hours of the twenty-four being spent in rest, according to tests made by the United States Department of Agriculture.

There are many wild horses on the island of Iceland. Formerly they were shipped to England for use in the mines, but that market is closing since mining machinery was adopted.

Animal hunters employed by the government use oil of catnip as a lure when hunting mountain lions and bobcats.

New species of insects are being found and classified at the rate of 6,000 a year.

PERFECT PHYSICAL RECOVERY OF A FOWL MAY FOLLOW AN ATTACK OF A SEPTICEMIC DISEASE

By B. F. KAUPP and R. S. DEARSTYNE

Laboratory of Poultry Investigations and Pathology

North Carolina Experiment Station, Raleigh, N. C.

The question of the ability of a fowl to withstand a severe onset of a septicemic disease, recover, and be an economic bird to save for breeding and laying purposes is one of much concern. Many birds so affected recover at the expense of body vitality to such an extent as to leave them emaciated, poor feeders, non-layers, and of no breeding or market value. There also exists the fact that among flocks suffering from contagious disease certain birds appear to possess natural immunity to the specific causative organism, and do not contract the disease, even when drinking from the same containers as the sick birds, feeding from the same hoppers, on the same range, and in intimate contact in every way with infected birds. Others have different degrees of resistance, some readily contracting the infective disease and succumbing quickly, while others with greater resistance linger longer before dying.

In the work being conducted at the North Carolina Experiment Station on the septicemic diseases of the domestic fowl, an instance of proven septicemia brought on by artificial infection with the organism of fowl typhoid, which did not prove fatal in the initial host, but proved fatal to another bird was demonstrated. The infecting organism was recovered from the blood current *via* wing vein on the fourth day after infection. Clinically this bird showed no signs of infection, and was discharged from the poultry hospital on the fifteenth day after infection. The organism recovered was used as the infecting agent for another bird, this bird showing acute symptoms of the disease four days after inoculation and succumbing fifteen days after.

The accompanying charts and tabulations give the clinical history of the two birds:

Received for publication, November 15, 1923.

HISTORY OF BIRD "A"

Subject: S. C. Rhode Island Red hen—mature.

Source: Hospital bird.

Condition on infection: Excellent.

Method of infection: 5 cc saline emulsion of a 24-hour, agar-slant growth of Klein's disease (fowl typhoid—State Serum Laboratories, Rotterdam, Holland), given in drinking water at 11:00 a.m., February 12, 1923.

CLINICAL STUDIES

Date	Respiration	Temperature	Laboratory tests
Feb. 7	48	106.4	Test for agglutinins (microscopic) negative at 1-50 and 1-100. Test for septicemia—negative.
" 10	48	106.0	
" 12	5 cc sal. emul. (Klein) fed in drinking water.	107.0	
" 13	49	106.0	Test for septicemia—positive.
" 14	48	106.5	
" 15	44	106.3	
" 16	41	106.2	Test for septicemia—negative.
" 17	42	106.0	
" 18	42	106.0	
" 20	44	106.4	
" 21	42	106.4	

BLOOD STUDIES

Date	Cell Counts		Differential			
	Red cells	White cells	Lymph. %	Poly. %	Mono. %	Mast.
Feb. 7	3,588,000	22,000				
" 8	3,188,000	20,000	61	39	1	
" 13	3,084,000	39,000	61	39		
" 15	3,022,000	34,000	73*	25		2
" 20	3,570,000	28,000	65	35		

*Small 67%; large 6%.

PRACTICAL DEDUCTIONS

It is evident that a slight lymphocytosis took place, with a total reduction of the number of red blood cells and an increase of the total number of white blood cells.

AFTER RECOVERY

Bird A was kept in an exhibition cage, 28 by 28, and was fed a laying ration with plenty of green feed. Between the day of discharge and the second day of June this bird laid 32 eggs, estimated as a normal production for the period, under such conditions of confinement as mentioned above, and was still in a laying condition on day of death, which was caused by rupture of liver, a result of concussion due to jumping from cage onto concrete floor.

HISTORY OF BIRD "B"

Subject: S. C. Rhode Island Red pullet.

Source: Central plant.

Condition on infection: Excellent.

Method of infection: 5 cc of a bacillary saline emulsion of

24-hour agar-slant of the organism isolated from the blood current of bird A was given in the drinking water at 4:00 p.m., February 19, 1923.

CLINICAL STUDY

Date	Respiration	Temperature	Remarks
Feb. 18	45	107.0	No septicemia.
" 19	42	106.9	
" 20	41	107.6	
" 21	35	108.0	
" 22	35	109.5	
" 23	35	109.8	Bird dejected, diarrheal dejecta, some blood, sulphurous-colored, watery droppings.
" 24	36	108.6	
" 25	36	109.3	
" 26	34	109.7	
" 27	42	109.9	
" 28	36	109.3	
Mar. 1	38	108.5	
" 2	38	108.4	
" 3	35	108.2	
" 4	35	108.0	
" 5	36	107.2	

AUTOPSY OF BIRD "B"

External appearance: The carcass shows marked emaciation, with pale face, unkempt plumage. There is a soiling of the feathers in the region of the vent, indicating diarrhea.

Liver: Hepatitis is present. The liver weighs 65 grams.

Kidneys: The kidneys show marked active and passive congestion.

Heart: The pericardium is pale. Hydropericardium is present. The heart has a parboiled appearance, with white areas in the myocardium.

Intestines: Both petechiae and ecchymoses of the mucous membrane of the small intestine are present.

MICROSCOPICAL STUDIES

Liver: Cloudy swelling; active and passive congestion is present. There are areas of leucocytic invasion.

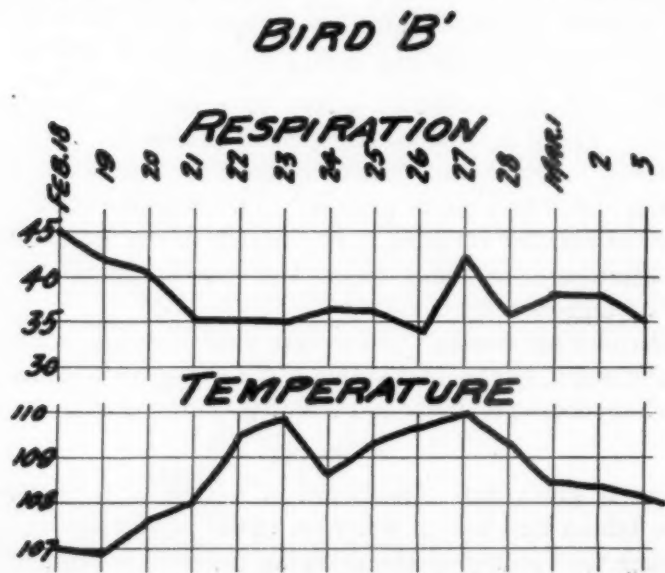
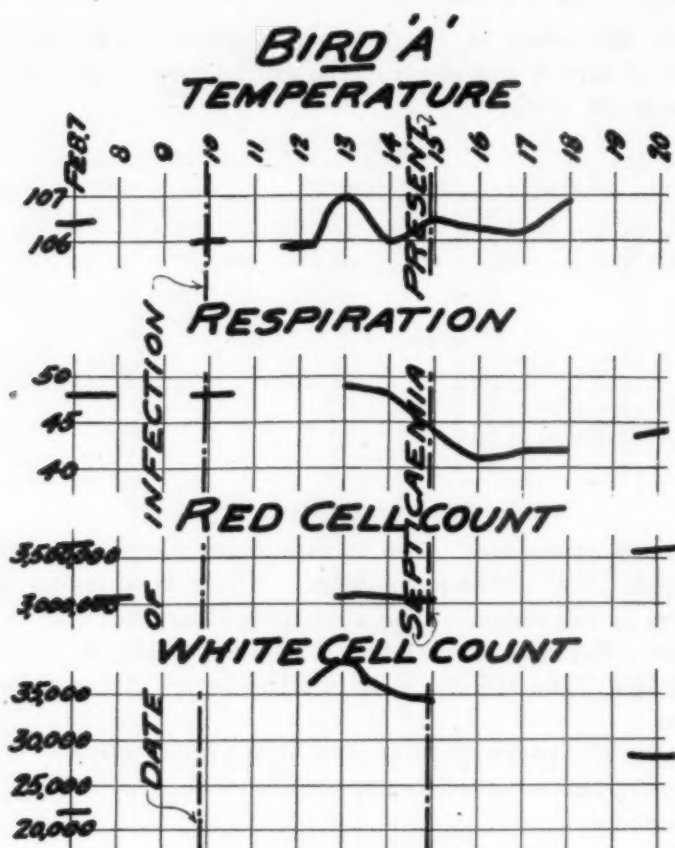
Kidneys: Active and passive congestion is present.

Heart: Myocarditis is present. The sections show various degrees of cellular invasion. The muscle fibers have lost their cross-striation. In many fields the muscle fibers are forced apart by masses of leucocytes.

Bacteriological studies: *Bacterium sanguinarium* is recovered from the heart, spleen, and kidneys. The cultures were identified by carbohydrate reactions and staining characteristics.

SUMMARY

There is given here the record of a case in a Single-Comb Rhode Island Red hen in which an initial septicemia developed, following the feeding in the drinking water of a virulent strain



of *B. sanguinarium*. The hen recovered without showing marked clinical symptoms. That the disease had developed in the hen was shown by the temperature rise, blood study, and the recovery of the organism from the blood of the wing vein.

A second bird inoculated with a culture of the recovered organism developed acute septicemia from which it died, showing typical symptoms, postmortem findings, and microscopic and bacterial confirmations.

The recovered fowl completely regained her former physical powers, as shown by the fact that in confinement on the proper ration she produced a normal, spring-cycle production in eggs.

VISITORS AT THE JOURNAL OFFICE

Among our members who have paid visits to the JOURNAL office during recent months are: Drs. J. D. Stilwell, of Indianapolis, Ind.; J. W. G. Hansen, of Greenville, Mich.; Russell A. Runnells, of East Lansing, Mich.; H. F. Leighton, of Pontiac, Mich.; Joseph Hawkins, S. Brenton, Donald C. Beaver, E. E. Patterson, H. C. Hughes, A. R. Ward, John Hoberg, Robert F. Blatchford and Joseph E. Zeltzer, all of Detroit.

FARM LIVE STOCK VALUES ON DECLINE

The total value of live stock on farms and ranges of the United States on Jan. 1 is estimated by the Department of Agriculture at \$4,912,907,000, a decrease of 266,258,000, or 5.1 per cent, as compared with their value on Jan. 1 a year ago.

Wild horses in the vicinity of Bend, Oregon, have increased so rapidly that they are becoming a nuisance. Extremely low prices for horses resulted in the ranchers turning them out into the mountains to shift for themselves.

Deer imported to New Zealand have become so large in numbers and so destructive to farmers' crops that it has been necessary to place a bounty of two shillings a head on them.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

PURPURA HEMORRHAGICA (PETECHIAL FEVER)

By GEO. E. FETTER, Hopewell, N. J.

Having read various reports of this disease in the JOURNAL I thought the following cases might interest our readers.

Case 1: Horse recently purchased from sales stables. Had been driven about ten miles in morning, although fore and hind limbs slightly edematous. On examination in evening found a well-marked case of purpura, temperature 103, increased respiration and pulse, swelling of limbs quite painful, numerous petechial spots in mucous membrane of nose and septum. Horse was given strychnia sulphate *per os* as well as a febrifuge. Second day swellings of limbs somewhat greater, as well as pronounced swelling of nose and nostril appearing. Temperature, pulse and respirations about the same. Third day swellings not so painful but extreme exudation from swellings of limbs. Petechial spots somewhat cleared up in nostrils. Temperature 101.4, pulse weak and respirations much reduced. Febrifuge was discontinued and animal was given strychnia only. Exudate from limbs continued for about three days and complete recovery in ten days, but animal quite emaciated.

Case 2: Horse had just recovered from pneumonia and was placed on strychnia solution to be given *per os*. Caretaker desiring an easy method, put the solution on the oats. Within forty-eight hours was called and found a case of purpura, petechial spots on mucous membrane of nose and septum, edematous swelling of limbs, slight temperature rise. I was tempted to give a hypodermic of strychnia but wished to satisfy myself that animal was not getting the strychnia solution that caretaker had put on the oats, so instructed that the solution be given *per os* and symptoms disappeared within seventy-two hours.

Case 3: Horse recently recovered from mild attack of shipping fever and to my knowledge had not been under treatment. Well marked case of purpura developed and when called found edematous swelling of limbs quite pronounced and painful, petechial spots in mucous membranes of nose and septum.

Temperature 102. Hypodermic injection of strychnia was given. Next morning temperature normal, swelling somewhat reduced and petechial spots not so pronounced. No febrifuge was given. Other injections of strychnia were given twice during the day and on the following day all symptoms had disappeared and animal was placed on strychnia solution to be given *per os* for a few days.

Much quicker and more pronounced results were obtained giving the strychnia hypodermatically in minimum and repeated doses.

Just what does cause purpura? It is my opinion that it is a nerve disease; whether caused by bacterial agents I will not attempt to say, but I believe that the vaso-motor nerves become so weakened that the blood vessels lose their tone and elasticity and hence the diapedesis of the blood corpuscles and serum and resultant petechiae.

INTESTINAL COCCIDIOSIS OF SHEEP

By L. V. SKIDMORE

University of Nebraska, Lincoln, Nebr.

History of the animals—October 11, 1922, the University of Nebraska purchased 300 lambs of Wyoming origin, on the Omaha live stock market for a feeding experiment. These lambs arrived in Lincoln, October 12, 1922, at 5:30 p. m. The following morning they were weighed. The average weight was 57.1 pounds each.

Symptoms—November 5, my attention was called to seven or eight of these lambs which were extremely emaciated and showed an unsteady gait and weakness in walking. Temperatures ranged from 102–105° F. Two of the lambs had diarrhea.

Mortality—Three of the lambs died on the following dates: One died November 19, one died November 22, and one died December 4.

Post-mortem findings—The most conspicuous lesions were found in the small intestines. Here the mucosa was slightly reddened and showed small, unraised, whitish spots, varying in size from a pin-head to a millet seed.

Microscopic findings—Upon microscopic examination it was found that these whitish spots contained masses of coccidia, identified as *Coccidium faurei*, which had invaded the intestinal

wall. Coccidia were also found in the feces of two of the affected lambs.

Treatment—No treatment was given to any of the 300 lambs. Strict sanitary precautions were observed in keeping the feed and water troughs clean. The lambs were fed heavy rations. No further deaths occurred.

DOES POULTRY PRACTICE PAY?¹

By H. C. SMITH, Jesup, Iowa

It may seem strange to the older practitioners to hear one say things relative to the treatment of various diseases of poultry. It may seem that the veterinarian of today, occupied with his treatment of horses, cattle, swine and sheep, has very little time to give poultry practice and diseases much consideration. Yet every day we are asked about this ailment or that trouble by the busy housewife of some good client.

In some cases we have to admit our ignorance while in others we make a snap diagnosis from history. We may have read in the professional journals of some new disease affecting fowls, and we may venture a guess that the trouble in question is the one described. Not all diseases of poultry are readily recognized or diagnosed. Acute cases of fowl cholera, fowl typhoid, bacillary white diarrhea and some nutritional conditions offer slight gross evidence for differentiation. Help in the handling of the flock is certain to be sought by the flock owners. Every encouragement should be given them by the veterinarian to seek the latter's help. Unless help from the veterinarian is forthcoming it will be sought from other sources. Now is the time when veterinarians should be awake and able to treat poultry diseases the same as those of other animals.

Diseases of the mucous membranes of the head and throat, such as chicken pox, ocular roup, and sinus or head roup, which oftentimes occur simultaneously, are probably the most tedious of all diseases of fowls to treat.

I believe that the average practitioner is able to recognize all three of these conditions but oftentimes he does not think he has the time to spend with them. I am sure he can treat these birds in a manner satisfactory to his client, both as to results obtained and money expended.

¹Written while a senior veterinary student, Iowa State College.

A flock of 75 birds, of which I am going to speak, showed all forms of chicken pox. Some showed scab formations on the wattles and combs. Others were affected with ocular roup only, having a swollen eye and in a good many cases the entire orbit filled with a cheese-like exudate which pushed the eyeball completely out of the orbit. In less severe cases the eyelids were swollen and adherent and in milder forms there were photophobia and lacrimation. In those affected with sinus or head roup the principal symptoms were dyspnea and swelling of the head. Production of a sticky, white exudate with a very characteristic odor is common to all forms of roup.

All birds were allowed to run together in a well ventilated pen with plenty of sunlight. Potassium permanganate was placed in the drinking water and changed daily. Each bird was treated individually and at intervals of four days, for a duration of three weeks. Those affected with chicken pox were treated by removing the pox scab by means of a curette and painting with tincture of iodine. Those affected with ocular roup were treated by taking a swab of cotton on a small stick about the size of a match, this was dipped in boric acid solution and used to clean the eye of pus and exudate. Those affected with sinus roup were treated also with boric acid solution, applied into the sinuses, through the roof of the mouth. The nostrils were smeared with salve containing menthol .25, camphor .25, in petrolatum as a vehicle.

In three weeks the birds were allowed to run at large. Ten of the worst affected were lost but this perhaps was due to being affected with all three forms. The hens that were laying before treatment, continued to lay during the treatment and when discharged were still producing. One hen in particular was blind in one eye but continued to produce her daily egg.

Poultry Practice Produces Profits.

Permanent Pastures Perpetuate Parasites.

Pernicious Practices Prostitute a Profession.

Systematic Sanitation Saves Swine.

REVIEWS

MEDICAL AND VETERINARY ENTOMOLOGY. By William B. Herms, Professor of Parasitology, University of California. Second edition, completely revised. 462 pages, with 229 illustrations in the text. The MacMillan Company, New York, 1923.

This work constitutes a textbook to be used in schools and colleges, as well as a handbook for the use of physicians, veterinarians and public health officials. The first edition of this book appeared in 1915, but the rapid growth of our literature on the subject of insects and related organisms, as they affect the public health and animal industry, has made it necessary for the author to rewrite a great deal of the subject matter, in order to keep it anywhere near its original limits. As it is, the new edition contains about 69 pages more than the original.

An historical account of the development of medical entomology has been incorporated, and many of the chapters have been enriched by the experience of the author as an army sanitary officer in the late war. Although the number of illustrations has not been materially increased, a number of those appearing in the first edition have been replaced by new ones.

In the index of authors whose work is referred to in the book, we note the names of many veterinarians, notably Graybill, Hadwen, Hall, Imes, Law, Mayo, Salmon, Underhill, *et al*, and several investigators equally well known for their veterinary investigations, such as Nuttall, Ransom and T. Smith. The frequent references to the original sources of the material in the book make it just that much more valuable.

The book is printed in a very readable type, the etchings from drawings are clear and distinct, but many of the half-tones are rather poor and in marked contrast to others which are very good. On the whole the book is well written and should be found in every veterinarian's library.

MEDECINE ET CHIRURGIE CANINES (Canine Medicine and Surgery). By P.-J. Cadiot and F. Breton. 4th edition. xi-420 pages, with 72 figures in the text. Asselin and Houzeau, Paris, 1924. Price, 20 francs.

This is a new edition of a book, former editions of which have met with a warm reception—both by students and practitioners

—all over the world. The tremendous growth in small animal practice and the intense interest being manifested in canine medicine and surgery contribute to make the appearance of this new edition very timely.

The authors have adhered to the general plan of previous editions, and in the addition of new matter they have been very careful to include only those new treatments or methods which have "stood the light," or of which there has been demonstrated proof of their efficacy or their superiority over the old.

Among the new subjects treated are: Tumors of the anal region, renal eustrongylosis, retention and incontinence of urine, retained placenta, leishmaniosis, irido-cyclitis, irido-choroiditis, retinitis and atrophy of the optic nerve, and caudal tenectomy.

Under infectious diseases, the authors first discuss distemper, half of the space allotted being given to treatment. The authors recognize a contagious broncho-pneumonia of the dog, and the disease is quite similar to distemper, clinically. They state that "the absence of the eruption is the principal differential sign." This is not in agreement with American authorities, who state that the cutaneous eruption may be absent in a great many cases of distemper. The authors are not very enthusiastic over prophylactic vaccination. They say: "Whatever is the nature of the infection, attention to hygiene and dietetics is of the utmost importance."

It is interesting to note that almost twice as much space is given to tuberculosis of the dog as to distemper, indicating the growing importance of the former infection.

ABSTRACTS

THE NOMENCLATURE OF THE MELITENSIS-ABORTUS GROUP OF BACTERIAL ORGANISMS. SEROLOGICAL CLASSIFICATION OF BRUCELLA MELITENSIS FROM HUMAN, BOVINE, CAPRINE, PORCINE AND EQUINE SOURCES. Alice C. Evans. Reprint No. 861 from the Public Health Reports of the U. S. Public Health Service, Washington, D. C.

Miss Evans has made a critical study of the various names assigned to the abortion and melitensis group of bacteria. She has also received the aid of Dr. C. W. Stiles, of the Hygienic Laboratory, in respect to the principles of Linnean nomenclature. As a result of these studies, she has determined that the proper name for this group, including both melitensis and abortion

bacteria, is *Brucella melitensis*. As a result of serological data, the writer has shown that strains of human, bovine, caprine, porcine and equine origin cannot be distinguished by the simple agglutination test. By the agglutinin-absorption test, these strains fall into distinct serological types which may be considered as varieties or subspecies. One may be designated as the *Brucella melitensis abortus* variety which includes the majority of bovine and porcine strains. The serological types, which consist chiefly of strains from human and caprine sources, may be designated as *Brucella melitensis melitensis*. It is also stated that a number of other species should probably be classed in this genus.

Miss Evans has also carried on a continuation of her work of 1918, when she pointed out that the causative organism of Malta fever and that of contagious abortion in cattle are closely related in their morphological, cultural, biochemical, serological and pathogenic characteristics. This work has been confirmed by Meyer and his associates in this country, by Zeller, Jaffé and Skaric in Europe, by Khaled in Egypt, and by Burnet in Tunisia. In this last study Miss Evans worked with forty-nine strains of *Brucella melitensis*. These strains came from various sources, some from cattle, swine, goats, horses and humans. They came not only from this country, but from various European sources. The author's studies consisted of an attempt to differentiate these strains by means of the agglutinin absorption tests. As a result of this study the following conclusions remain:

(1) "This species may be differentiated into at least seven serological groups. Four of these groups included only one or two strains each, and were relatively unimportant.

(2) "The majority of bovine and porcine strains fell into one large group (30 strains), which is designated variety *abortus*. Two strains of human origin were of this variety. Two of the small serological groups are so closely related to this one that they should be considered as subvarieties. One of these includes only one strain of bovine origin; the other includes two strains, both of human origin.

(3) "Another important group includes strains of human, bovine, caprine, and equine origins (11 strains). It is designated variety *melitensis A*.

(4) "A third group of three strains characterized morphologically by a predominance of coccoid cells assumes importance from the evidence that this was the variety that Bruce was working with when he named his newly discovered organism "*Micrococcus melitensis*." It is designated variety *melitensis B*.

"Simple agglutination tests can not differentiate between varieties *abortus* and *melitensis A*. These two varieties can be differentiated from *melitensis B*, by the simple agglutination test only when the titer of the serum used is accurately known for the several varieties."

There can be no question but that the germ causes abortion in animals and that causing Malta fever in man are very closely

related. The exact bearing that this has on human health has not yet been determined. It should be kept carefully in mind, however, and further experiments will demonstrate the exact significance.

C. P. F.

STUDIES IN VACCINAL IMMUNITY TOWARDS DISEASE OF THE BOVINE PLACENTA DUE TO *BACILLUS ABORTUS* (Infectious Abortion). Theobald Smith and Ralph B. Little. Monograph of the Rockefeller Institute for Medical Research, No. 19, November 15, 1923.

This is a completed report of work carried on at the Rockefeller Institute for the Study of Animal Diseases, at Princeton, New Jersey, for a period of five years, on the question of the production of immunity. Living cultures and cultures killed by heat have been employed in this work.

Two experiments have been carried out.

1. "In one experiment, comprising 134 control and 53 vaccinated heifers, the abortion rate, following vaccination with living cultures, was 16.7 and 11 per cent respectively for first and second pregnancies, as compared with 25.1 and 19.2 per cent for the control groups.

"In a second experiment, comprising 35 heifers treated with heated cultures and 10 with living cultures, the combined abortion rate for the first pregnancy was 14.7 per cent as compared with 41.6 per cent for 38 controls. The rate for the 10 treated with living cultures was 0. The above estimates do not include those cases in which full-term pregnancies were associated with infected or diseased placentas."

The authors also state that living cultures should be used only in herds in which abortions in the first pregnancy are common. They were not able to determine the relative efficiency and danger of recently isolated strains of *Bacillus abortus* and those cultivated for several months or years. They believe, however, that the older cultures should be employed in the preparation of the vaccine. No gain seems to be had in two injections of living vaccines. Several cases of abortion due to *Vibrio fetus* were determined in their studies.

"The use of vaccines does not in itself tend to eliminate the infectious agent from any herd, although it may greatly reduce the infectious material quantitatively by reducing the number of cases of placental disease.

"Animals treated with living virus should not be herded with the unvaccinated unless the latter have passed through the disease or have a high agglutinin titer.

"Cultures of *Bacillus abortus* exposed to the lowest temperature which will kill all bacilli and injected repeatedly may produce a relatively high degree of resistance."

This publication is an extensive one (124 pages) and should be carefully read by all those interested or concerned with the problem of abortion disease.

C. P. F.

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of Sixtieth Annual Meeting, Montreal,
Canada. August 27 to 31, 1923.

(Continued from p. 507, January Journal)

THURSDAY MORNING, AUGUST 30, 1923

The meeting convened at 9:30, President Welch presiding.

PRESIDENT WELCH: We will listen to a further report of the Executive Board.

DR. WAY: Mr. President and Gentlemen: At a meeting of the Executive Board in Chicago, some two years ago, a representative of a local association appeared before the Board (he was not a member of our Association) and endeavored to present a very radical and revolutionary change to the constitution and by-laws of this Association.

A year ago, at the meeting of the Executive Board in Chicago, some of the members of the Board recognized a general feeling of unrest, not only in our Association, but generally throughout the country.

The Secretary of our Association had asked for a definite statement of policy, which he might carry to the various state and local associations, and, in view of the demand or the need for some such declaration on the part of this Association, one of the members of the Executive Board presented a resolution calling attention to the fact that this was highly desirable, and suggested the appointment of a committee.

Our good President was sitting with us at that meeting of the Board, and, in conference with him, the Chairman of the Board appointed a committee, which was a committee of the Executive Board, to study the question and prepare something that this Board might officially present to you. The Committee worked for about six months.

The various subjects that were considered were allotted to different members of the Committee, each man preparing a statement that he considered would be advisable to accept or to adopt as a policy. The various statements were assembled by the Chairman, and typed and re-distributed to every member of the Committee.

Several meetings have been held since the middle of July, and, after hours of discussion and the burning of much midnight

oil at this meeting, the Executive Board is pleased to present, in as clear-cut and as definite a form as it seems possible, its recommendation for a policy that may be adopted by this Association.

. . . Dr. Way read the proposed policy. (Published in JOURNAL, December, 1923.) . . .

DR. WAY: Mr. President, I move the adoption of this policy.

. . . Seconded by Dr. Mayo . . .

DR. CARY: I want to ask for information regarding the establishment of those committees. Are those special committees or permanent committees?

DR. WAY: Permanent committees.

DR. CARY: We have no authority for establishing permanent committees without bringing in an amendment to the constitution and by-laws. We cannot accept a report of that kind except for special committees.

PRESIDENT WELCH: The point is well taken, Dr. Cary.

DR. MAYO: This is a rather typical Yankee report. I don't mean necessarily from New England, but made that distinction to separate us from the Canadians.

South of the line we have a penchant now for regulating every phase of human activity. We are going to legislate you good whether you want to be good or not. We have got a fad for legislation, and this is really legislation.

Now, I want to say that I approve this in its general plan; I believe that the Association should have a pretty-well-established policy, but I seriously question, Mr. President, whether they ought to go into detail as to how all of these policies should be carried out; at least, without further consideration than we have given it so far. I had a little to do in conference with some part of this, with reference to the veterinary biologics. It is just as logical to take veterinary pharmaceuticals.

The point is that I think the policy should be general. We can get the details afterwards. I think that this whole plan, before it is adopted, should be published in the JOURNAL. Now, it is pretty good. I am not knocking. I like the whole thing pretty well. I am naturally good myself (laughter), and it doesn't make much difference to me, but I really think it would be better to postpone definite action on this for another year. I know the Committee has done some hard work on this, but it is very wide-reaching in its influence. It is a very expensive proposition, and, for instance, take the question of county

veterinarians or district veterinarians: I don't know whether the policy on that is going to be right. It looks that way now, but I certainly would like to give that a good deal more consideration before we vote on it.

Mr. President, I move that the policy as presented be published in the JOURNAL and laid upon the table for one year.

The motion was seconded by Dr. Kinsley and Dr. Cary

PRESIDENT WELCH: It is moved and seconded that the report of this Committee be published in the JOURNAL and lie on the table for one year. Are you ready for the question?

DR. FERNEYHOUGH: I want to see if I understand this. I understood him to second the motion.

DR. MAYO: In order to get that report before the house, a motion had to be made and seconded to adopt it.

Now, this motion is to lay it on the table for a year, which is in order, but with that, I coupled the idea of having it published in the JOURNAL, so that all members can have a chance to study it.

DR. W. L. WILLIAMS: I raise a point of order. The motion before the house is not open for discussion, a motion to lay on the table.

PRESIDENT WELCH: A motion was made and seconded that the report be published and lay on the table for one year. All in favor, say "aye," opposed, "no." I am unable to decide.

A rising vote was had, and the motion was carried, 38 to 28. . . .

DR. MAYO: Mr. President, may I rise to a question of privilege? I don't want the impression to go out that I am opposed to this. There were some who seemed to think I was. I am rather in favor of it, but we want to get the practitioner interested in this just as much as possible, and I want to give him a chance to express his opinion, not only through the year, in the JOURNAL, but next year when this will come up for final adoption.

DR. CARY: I would like to say a word. I am not opposed to these committees, or the formation of the committees, but I don't think we ought to hop up here and establish a permanent committee, by a motion, to go into effect for years, without considering an amendment of the Constitution. This Association has no right to establish a permanent committee, without an amendment to the constitution and by-laws. It is time we are getting in the habit of following the constitution and by-

laws or doing away with them. If, every time we want to do something, we get up here and say we want to do something by motion and do it regularly, we will get to be the laughing-stock of other associations and everybody else.

I am not saying I am fighting this thing. I am in favor of a great majority of the things presented there, and I will vote for it if the committee is established rightly, but I don't think the Executive Committee has a right to get up here and violate the constitution and by-laws.

DR. WAY: I might have misunderstood Dr. Cary's original question. The thought of the Executive Board in this recommendation is to create a committee that will be permanent in character, and workable from year to year, so that questions of policy may be referred to the proper committee, and that questions pertaining to veterinary biologics may be thrashed out with the Bureau of Animal Industry which regulates those products and the manufacturers who manufacture them.

PRESIDENT WELCH: Gentlemen, we will proceed to the regular program. The first on the program will be "The Practitioner as the Foundation of Veterinary Service," by Dr. E. R. Steel, Grundy Center, Iowa. (Applause.)

Dr. Steel presented his prepared paper. (Published in the JOURNAL, October, 1923.)

PRESIDENT WELCH: We will pass on to the next part of the program which is "Some Laboratory Findings and Conclusions Regarding the Bang Abortion Organism which Puzzle Clinicians," by Dr. W. L. Williams, of Ithaca, N. Y. (Applause.)

Dr. Williams presented his prepared paper. (Published in the Journal, November, 1923.)

PRESIDENT WELCH: The next on the program is "The Challenge to the Veterinary Profession," by Professor H. Barton and Dr. Conklin. Professor Barton is unavoidably absent this morning.

Dr. Conklin read the prepared paper. (Published in the JOURNAL, December, 1923.)

PRESIDENT WELCH: Is there any discussion? If not, at this time I want to grant the Chairman of the Revision Committee a chance to make a motion to take up a matter that was left unfinished. There is a motion before the house to recommit the report of the Committee on the Revision of the Constitution and By-laws to the Executive Board for further consideration. That motion is before you. The motion is ready for discussion.

DR. McLEOD: I believe that was very satisfactory to the Committee on Revision. It will expedite matters if the Committee can report their findings and recommendations tomorrow.

PRESIDENT WELCH: Are you ready for the question?

. Calls for question

. The motion was carried

PRESIDENT WELCH: Gentlemen, what is your pleasure? It is ten after twelve, and we are billed to leave the Grand Trunk Station at one p. m.

. It was voted, on motion of Dr. McLeod, duly seconded, that the meeting adjourn.

. The meeting adjourned at 12:10

ADJOURNMENT

FRIDAY AFTERNOON, AUGUST 31, 1923

The meeting convened at 2:00 p.m., President Welch presiding.

PRESIDENT WELCH: The first thing on the program will be a report from the Executive Board.

DR. KIERNAN: Mr. President, during the absence of the Secretary, I want to make a recommendation of the Executive Board. It is recommended that Dr. Hoskins' salary be increased to five thousand dollars per annum, beginning October first, 1923. The Board commends the very satisfactory service rendered by Dr. Hoskins, and also recommends that he be instructed to take a two-weeks vacation at his convenience.

I move that the recommendation be adopted by the Association.

. The motion was seconded by Dr. Faust and carried

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SECRETARY HOSKINS: The following applications for membership have been approved by the Executive Board. (Read the list.)

PRESIDENT WELCH: What shall be done with the applications?

DR. MAYO: Mr. President, I move that the applicants whose names were read be elected to membership in the Association, and the Secretary be instructed to cast the ballot of the Association for them, if in order.

. The motion was seconded by Dr. Faust, and carried

SECRETARY HOSKINS: We have some resignations which require action. The following members have tendered their

resignations during the past year. These resignations have been presented to the Executive Board, and the Executive Board has recommended them to the Association for acceptance.

Baker, S. S., c/o Standard Biscuit Co., Des Moines, Iowa.

Boyce, Nelson V., 610 Sandusky Ave., Kansas City, Kans.

Brouse, Stanley C., R. F. D. No. 13, Dayton, Ohio.

Carl, L. W., 1128 Wyandotte Road, Columbus, Ohio.

Fabian, Arthur E. H., 421 Walworth St., Lake Geneva, Wis.

Gain, J. H., Francois Lake, B. C., Canada.

Kampschmidt, Frank L., 1172 West 39th Pl., Los Angeles, Calif.

Kirch, Lawrence P., 315 Sanders St., Indianapolis, Ind.

Meenen, P. J., Fremont, Nebr.

Paul, A. F., Jr., 3421 Dent Pl. N. W., Washington, D. C.

Schneider, Ernest, Kulm, No. Dak.

Stanley, Carl B., Bellville, Ohio.

Starr, G. H., Norris City, Ill.

Weeks, Burgess E., Consecon, Ont., Canada.

Welsh, Mark F., College Park, Maryland.

Whiteman H. J., 1301 Ligonier, Latrobe, Pa.

Wilbur, Bert Raymond, Randolph, N. Y.

Winter, John H., Meadville, Pa.

I might add, at this time, that in the majority of cases these resignations are being tendered on account of change in occupation. In a few cases it was a case of financial stringency, and in several cases no reasons were given and none could be obtained.

PRESIDENT WELCH: A motion to accept these resignations is in order.

It was voted, on motion of Dr. Kiernan, duly seconded by Dr. Mayo, that these resignations be accepted, as recommended by the Board.

SECRETARY HOSKINS: Several other matters: The Secretary was instructed to get a public accountant to examine his accounts, as of October 1, 1923, which will be one year from the time that the office was taken over. The report of the accountant is to be presented to the Executive Board, at the meeting in Chicago, in December.

The Executive Board considered the amendments which have been offered, with the following action: The report of the Committee on Revision of Constitution and By-laws was read, and it was voted, on motion by Dr. Munce, seconded by Dr. Stange, that the report of the Committee be received. It was voted on motion, duly seconded, that the amendments be read.

Secretary Hoskins read the amendments.

DR. CARY: Mr. Chairman, owing to the fact that there has been some question of the legality of the presentation of these amendments, it has been agreed on by a number that it would be best to lay these on the table, and have all these propositions lie over for another year.

Therefore, I move that this recommendation be laid on the table.

The motion was seconded by Dr. Munce

DR. MAYO: If this is to be considered official, notice of a change of constitution must be given.

DR. CARY: Give official notice later.

The motion was carried

DR. CARY: Mr. President, I hereby introduce the proposed amendments, as published in the March, 1922, issue of the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, to take the regular course and be presented by the Executive Board for adoption or rejection at the next regular meeting of the American Veterinary Medical Association.

These are printed; they are fixed in printed form as reported, and they are to be printed again next year as another notice, by the Secretary. I introduce this.

The motion was seconded by Dr. Munce, and carried

DR. CARY: I move that a committee of five members be appointed to be known as a special committee on Revision of the Constitution and By-laws to report at the next regular meeting of the American Veterinary Medical Association.

The motion was seconded by Dr. Munce

DR. STANGE: May I ask for a little information here? I wonder, Dr. Cary, if it would be well for that committee to report to, or work with, the Executive Board, so the thing may be in shape for action.

DR. CARY: They will have to work with the Executive Board, as provided in the previous motion.

DR. STANGE: I understood at the next meeting. I think the Executive Board ought to have this before the next meeting.

DR. CARY: They will have.

DR. STANGE: The Executive Board would have time to go over this matter and have it in good shape for action at the next meeting. That was my point, Mr. Chairman.

DR. CARY: That is the custom, and it always must go through the Executive Board, the same as it has always been. We can have it stated in there if you want it.

DR. STANGE: My only point was that I would like to see the whole matter in good shape for action next year. I thought if they would report to the Executive Board and the Executive Board could go through this, it would be ready for action.

DR. CARY: Make that as an amendment, and I will accept it.

DR. STANGE: I will make that amendment.

DR. CARY: I will second the amendment that they report to the Executive Board.

. . . The vote was taken on the amendment, and it was carried . . .

. . . The question was then put on the motion as amended, and that also was carried . . .

SECRETARY HOSKINS: It is proposed that Article 17, Section 1, be amended by changing the word "audit" to "policy" and add "veterinary biologics." This is merely the formal notice to provide for the two committees which are proposed in the report of the Committee on Policy.

DR. MAYO: Mr. President, I move that this be received and referred to the Committee on Revision of Constitution.

. . . The motion was seconded by Dr. Cary. . . .

PRESIDENT WELCH: All amendments have to be referred to the Executive Board.

DR. MAYO: My understanding was this committee has to refer to the Executive Board later, and it will of necessity go there. It was only to facilitate the work of getting it in shape that I moved to refer it to that committee.

SECRETARY HOSKINS: There is nothing to prevent its being referred to both.

. . . The motion was seconded . . .

DR. MAYO: Mr. President, I will change that, if it is desirable, to read "to the Executive Board and the Committee on Revision of the Constitution and By-laws."

DR. CARY: I will accept that.

. . . The motion was carried . . .

PRESIDENT WELCH: The next, gentlemen, is the report of the International Committee on Bovine Tuberculosis. Dr. Kiernan.

. . . Dr. Kiernan read the report of the Committee (Applause.) . . .

. . . It was voted, on motion by Dr. Mayo, seconded by Dr. Munce, that the report of the Committee on Bovine Tuberculosis be received and referred to the Executive Board . . .

REPORT OF INTERNATIONAL COMMITTEE ON TUBERCULOSIS

Your committee continued to make studies of animal tuberculosis during the past year and has the honor to submit for your consideration this brief report which is confined principally to the cooperative campaigns that are

being conducted in the Dominion of Canada and the United States for the control and suppression of the disease.

Active campaigns are being carried on in both countries. The main feature of the work is the gradual expansion of the area plan. This plan has proved both effectual, as far as eradicating the disease from the live stock in a given area, and popular with the live stock owners because it reduces the danger of reinfection in the herd by removing the cause from all the herds in the area rather than the cleaning up of individual herds which are left in close proximity to infected ones, and because it may be conducted at less expense. The controlling feature in the eradication campaign is a financial one. Whenever indemnity is paid for condemned tuberculous animals, the work is limited by the size of the funds made available for that purpose each year. It becomes necessary, at times, to suspend operation on account of the exhaustion of indemnity appropriations.

MODIFIED ACCREDITED AREA

The outstanding event of the campaign during the past year was the creation of what is known as modified accredited areas: free of cattle tuberculosis. This method was inaugurated by the United States Live Stock Sanitary Association, which recommended to the Secretary of Agriculture of the United States that such a plan be adopted. On July 23, 1923, an amendment was made to the federal regulations having to do with the eradication of cattle tuberculosis, in which provision was made for classifying certain areas where the disease had been practically eliminated as modified accredited areas. As a result of this action by the Department, these areas will be recognized and will be freed of certain inhibitions which are necessary in other territories. The regulations will be carried out by the Bureau of Animal Industry in cooperation with live stock sanitary authorities. The states will maintain quarantines to protect the designated areas from the introduction of untested animals from other states.

Under the amended provisions, a county may be designated as a modified accredited area when a complete test of all the cattle in the area shows less than one-half of one per cent to be reactors. These herds in which infected animals are found will be quarantined and cannot be retested in less than 60 days from the date of original test. Once an area is put into this modified accredited classification no cattle can be brought in (except for slaughter and steers for feeding purposes) unless from an accredited herd or after having passed a satisfactory tuberculin test applied by a qualified approved or accredited veterinarian.

When an area is designated by the cooperating state and federal authorities as modified accredited area, it will remain so classified for three years, providing there are no indications, through animals slaughtered or in other ways, that the percentage of tuberculosis does not exceed one-half of one percent at any time. If it is found that one per cent or more of the cattle in an area are found to react, then all cattle must be retested. If the infection is between one-half of one per cent and one per cent, then only the infected herds must be retested, and when their percentage of reactors is reduced to not more than one per cent, the area may be classified as a modified accredited area. The first list of counties to be placed in the modified accredited areas contained seventeen, located in four states.

STATE WIDE ERADICATION

Another noteworthy movement of eradication of bovine tuberculosis that occurred during the past year was the issuing of an order by the Louisiana State Board of Health requiring the annual tuberculin testing of all dairy cattle from which milk is sold for human consumption. These are the first state-wide, tuberculosis-eradication movements inaugurated in the United States. It will be observed with great interest because it is a demonstration as to whether or not it is possible to organize a force of sufficient size to apply the tuberculin test to all of the cattle in a state within a reasonable length of time.

NEW YORK SUPREME COURT DECISION

Another incident of importance was the decision rendered by the Supreme Court in New York State on the validity of a city milk ordinance requiring the tuberculin test. An excerpt from the decision is as follows:

"Morschauer, J.: The question for determination is the regulation of the board of health passed July 20, 1920, taking effect May 1, 1921. The Board of Health of the city of Poughkeepsie on July 20, 1920, made and published a regulation that, in effect, prohibits the sale of any milk in Poughkeepsie, except what is designated Grade-A-Raw and certified milk, unless the same is pasteurized.

Some of the fatal diseases known to be conveyed by milk are typhoid fever, malaria, scarlet fever, tuberculosis, diphtheria, septic sore throat, diarrhea and enteritis. In order to guard against the introduction of disease germs into the milk, provision is made for the inspection of dairies and the tests of the cows for tuberculosis."

"Certified Milk—Cows must be tuberculin tested once during previous year and reactors excluded; farms must be scored not less than 35 per cent for equipment and 50 per cent for methods; employees must be examined by physicians; milkers to wear washable suits, not worn at other times; bacterial count not more than 10,000 bacteria per cubic centimeter.

Grade-A-Raw—Cows must be tuberculin tested once during the previous year and reactors excluded; farms must be scored not less than 25 per cent for equipment and not less than 50 per cent for methods; milk must not contain more than 60,000 bacteria per cubic centimeter.

The Board of Health had power to make the regulation. Section 2-b of the public health law (Consol. Laws, c.45) gives the public health council of the State Department of Health power to establish a sanitary code, which shall have the force and effect of law.

The sanitary code was designed to protect the public health and should receive at the hands of the court a liberal interpretation. *People v. Frudenberg* (209 N. Y. 218; 103 N. E. 166).

The learned counsel for the realtor stated at the hearing at different times that the milk dealers would suffer great loss of property by the regulation and they would have to discontinue their business. The answer to all this is that when it becomes necessary for the health, safety and welfare of the community, individual rights must give way. Courts will uphold the actions of public bodies when they perform their duties within the law, even though such actions may be in restraint of trade or may interfere with business interests. The rights, safety and welfare of the community are paramount to that of individuals engaged in a business that might place in danger the lives of its citizens."

In conclusion, the committee takes great pride in reporting that the live stock owners, both in the Dominion of Canada and the United States, have a very high regard for the good work that the veterinarians are performing in eliminating tuberculosis from their herds and preventing the spread of the infection to healthy herds.

PRESIDENT WELCH: The report of the Committee on Abortion.

DR. STANGE: May I present a little matter at this time? I have a little matter here which was brought up at the St. Louis meeting. I presented an amendment to the Constitution and By-laws, relative to membership in the American Veterinary Medical Association. The notice was to amend Article 1, Section 3, to read, "The members of this Association shall be of three kinds, active, honorary and junior."

Now, in explanation, I might say that my idea was to provide a junior membership in the American Veterinary Medical Association which could take in students in veterinary schools. They would not be active members, nor honorary members, but junior members, and we could get the American Veterinary Medical Association work started among the students while they were still in school.

The details of this would have to be worked out. There is a provision in the constitution and by-laws, now, that the Executive Board shall make such regulations as are necessary to carry the constitution and by-laws into effect.

I believe we might still provide for the junior membership and work out the details this coming year. It will automatically go to this Revision Committee as part of the constitution and by-laws, if it is adopted, and the details can be worked in next year.

My idea is this: That we have our veterinary schools help the Association. Now they graduate them, allow them to go away and locate, and then we go out and try to get them into the American Veterinary Medical Association. It seems to me the best way to get those boys interested is to show some interest in them while they are in college and get them interested in the American Veterinary Medical Association, and then it will be much easier for them and us to go right on as members in the Association.

That was the idea in offering this amendment. It was offered in St. Louis, and I move its adoption at this time.

The motion was seconded by Dr. Kiernan, and carried

PRESIDENT WELCH: Now the Committee on Abortion.

In the absence of Dr. Fitch, Dr. Giltner read the report

DR. MAYO: Mr. President, I move that the report be received and referred to the Executive Board.

The motion was seconded

DR. SAVAGE: Mr. Chairman, if I may be permitted, I should like to move an amendment to this effect: That the Committee on Abortion be discontinued, and, speaking to that amendment, there are one or two things which I think it is desirable to say.

DR. W. L. WILLIAMS: I will second the amendment.

DR. SAVAGE: Speaking to the amendment, Mr. Chairman, in spite of the fact that I have conferred with a number of the Committee on this subject, there are one or two things it seems to me should be said.

To begin with, it seems obvious that no committee can possibly control abortion. For that reason, it appears that the Committee has been given an impossible task.

In the second place, I doubt very much if this Committee, or any other like it, can even unify public opinion with regard to such a highly contentious subject, and, in the third place, as the Committee is not essentially a research committee, I fail to see how they can report definite findings with unanimity. It seems that in the past they have considered the results of others,

and that their results have been more or less of a compromise of their various personal opinions and interpretations.

PRESIDENT WELCH: Any further remarks?

DR. W. L. WILLIAMS: Mr. President and Gentlemen: It appears to me, as Dr. Savage has presented the matter, that the Committee is given a task which it is impossible to perform. If the president selects a number of men who have definite opinions upon the subject of abortion, and they come in to the Committee, it is impossible for them to agree upon the scientific facts and conclusions they have to consider. The result is that a compromised report is made, which does not truly state the opinion of any one man upon that Committee. It seems to me that the task which has been assigned to this Committee is one which is absolutely out of the ability of any committee, however it be formed.

The discontinuance of this Committee will not disturb the study of abortion; it will not delay it. It is a committee which was created upon a motion, and can be terminated by a motion, and for that matter could be terminated without a motion at the discretion of the president, I think, and it can be renewed at any time that we have any particular question which a committee might properly consider.

For instance, there is now a movement, as I understand it, in some states, to quarantine against animals for abortion upon the agglutination test. If it is attempted to enforce those laws, then a committee might well consider what we may mean by reaction to the agglutination test, whether it be a titre of one to twenty-five or one to fifty or one to a hundred, and they might define what we mean by a given statement, and to that we could all agree, a compromise, it is true, but if the statement were then made that a certain animal reacted, we would know that the blood agglutinated at the point upon which we had agreed.

But, aside from that, I do not see the necessity for expending the effort and for having men place themselves in a position where the committee reports one thing and where the men outside of the committee say another. It is very trying for a man to do that. Yet there is no escape for him. No matter how tactful a man is, he must say one thing in the committee and something else outside of the committee; otherwise it could not be a uniform report.

We are paying, as I understand it, about five hundred dollars

per annum for supporting the traveling expenditures of this Abortion Committee. I may be far afield in that estimation, but I think that is about it. It seems to me we might be a trifle more economic until we see that we need the services of the Committee in establishing some precedent or some general designation of what we mean by a given term or that they can perform some other service which is of real value to the Association.

PRESIDENT WELCH: Any further remarks?

DR. WATSON: I am rather alarmed at the thought that the Committee on Abortion should be discontinued. Personally, I have found it of the greatest use in my laboratory work and in answering questions pertaining to contagious abortion. As Dr. Savage has said, the literature on this subject is immense. It is scarcely possible for a busy man to collect, coordinate and interpret all the literature that is written from day to day on contagious abortion, and I believe this Committee which is appointed is in much better position to collect that literature and interpret it, and the findings of all these research men, to coordinate it and give us the result, especially when it is criticized and digested and turned over by a committee of four or five than it is for individuals.

As I say, the literature is so immense, I think, for that purpose alone, if the Committee coordinates the literature and gives us its views of the status and the progress that has been made in dealing with contagious abortion in every respect, that alone justifies it.

DR. SCHROEDER: As a member of the Committee I want to make sure I did not misunderstand Professor Williams in one remark he made. That is, members of the Committee say one thing in their reports, and in private conversation say things of a different nature. Did I misunderstand you?

DR. WILLIAMS: Mr. President, Dr. Schroeder understood me correctly. My judgment is that there has to be a compromise and an average opinion given upon given points in the committee, and that that opinion specified by the committee as a body does not accurately represent the views of any member of it.

PRESIDENT WELCH: Any further remarks? If not, the question is upon the amendment that this committee be discontinued. All those in favor of the motion, signify by saying "aye," opposed, "no." The amendment is lost.

The motion is that the report be received and referred to the Executive Board. The motion is carried.

REPORT OF COMMITTEE ON ABORTION

Your Committee has had two meetings during the year, at which all questions pertaining to bovine infectious abortion were carefully discussed. It was found during the discussions that nothing radically new or of real importance has been discovered since the last report of the Abortion Committee was presented that could be added to previous reports or that makes a revision of the statements made in previous reports necessary.

The very nature of bovine infectious abortion is such that the rapid acquisition of knowledge regarding it cannot be expected, and your Committee while it recognizes the great importance of placing every newly discovered fact before the Association without delay, together with the significance it may have, does not believe that it is desirable to present a lengthy report unless it can impart something that may have real value in the sense that it is something which has not become generally known or in the sense that it is serviceable for the rectification of existing beliefs.

Owing to the great importance of bovine infectious abortion your Committee recommends that a committee on the subject be kept in existence, particularly as many investigations are now in progress or have been planned, the results of which, as soon as they are available, should be reported to the Association.

(Signed) J. F. DEVINE
E. C. SCHROEDER
A. EICHORN
WARD GILTNER

Next is the report of the Committee on Prevention and Control of Animal Diseases.

. . . Dr. Turner read the report . . . (Applause.)

DR. KIERNAN: I move that the report be accepted and the Committee be continued. (Report will be published in March issue.)

. . . The motion was seconded by Dr. Watson . . .

PRESIDENT WELCH All in favor of receiving this report and continuing the Committee, signify by saying "aye;" opposed, "no." The motion is carried,

The report of the Horse Association of America. Is Dr. Muldoon here? (Not present.)

Report of the Committee on Intelligence and Education.

. . . Dr. Goss presented the report . . . (Applause.)

DR. MAYO: I move that the report be received and referred to the Executive Board.

. . . The motion was seconded by Dr. Schroeder . . .

DR. MAYO: There is one point in this report that is new and, I think, very suggestive, and that is the feeling of the Committee that those members of this Association who are teaching in schools not recognized by the Association should be considered unethical.

Now, I was in hope that the Committee would put that in the form of one of their recommendations, because I think it

would be an important factor in either bringing them into line or at least conveying to the students who go there some idea of the standing of those who are supposed to give the instruction.

Unfortunately, in many instances in the past at least, students have gone to an institution that was not recognized by this Association, and they didn't know it, sometimes, until after they had been there a year or two. It is a very unfortunate situation, and it works a great hardship on some students. I would like to see this put in a way so that we can notify those members of ours who are teaching in these schools that unless they discontinue, charges would be brought against them.

DR. FERGUSON: I believe in referring that to the Executive Board, the Executive Board will take care of that part of it.

DR. V. A. MOORE: It seems to me there is some danger in this matter. We have, as I see it, no control over the curricula that are followed in agricultural colleges. If an agricultural college wants to have a department of veterinary science, including hygiene and anatomy, I don't see that is any concern of this Association, and if those students who take those courses apply to regular veterinary colleges where they are to receive a degree in veterinary medicine, and ask for a time credit for the courses that they have taken in the agricultural college, then it becomes a matter for this Association, but so long as an agricultural college wants to teach anatomy, physiology, bacteriology or hygiene or any of those subjects, basic sciences which go to form a veterinary curriculum, and also perhaps an official curriculum, I don't believe that it is a matter for this Association to take up.

PRESIDENT WELCH: Any further remarks?

DR. MAYO: If Dr. Moore thought I said agricultural colleges, I misspoke myself. I referred particularly to veterinary colleges that are not on the accredited list. May I say a word more?

It is rather a delicate subject, and I don't know that we can do anything now, but what I wanted to get into the proceedings of this Association, so that these men would see it and read it, would be the expression of opinion of this Association that it wasn't ethical. I think that some of them would appreciate that, and that would be helpful.

PRESIDENT WELCH: Are you ready for the question that this report be received and referred to the Executive Board?

. . . . The motion was carried (Report will be published in March issue.)

DR. GOSS: The Committee on Intelligence and Education recommends the following men for honorary membership in the Association: Sir Arnold Theiler, Professor Charles Porcher and Professor Alcide Railliet.

. . . It was voted, on motion of Dr. Watson, duly seconded, that the recommendation be adopted . . .

DR. MAYO: Mr. President, I move that the Committee on Intelligence and Education consider and report upon the question of preparing some suitable form of acknowledgment to be presented to some veterinarian, member of this Association, or anywhere in the world, as a recognition for distinguished and exceptional work in connection with the advancement of veterinary science.

. . . The motion was seconded by Dr. V. A. Moore . . .

DR. MAYO: I don't know but I would like to change that word "veterinarian" to veterinarian or scientist," with the consent of my second.

The idea I have in mind is that the Committee will consider the matter of a medal to be awarded by this Association as a recognition of outstanding scientific work in the advancement of veterinary science. It isn't my idea that this should be awarded every year. It may be a number of years, but what suggested it to me was the very remarkable work that has been done by a fellow member of this Association who sits here in front of me now, Dr. Hall. (Applause.)

PRESIDENT WELCH: If there are no further remarks, all those in favor of the motion will signify by saying "aye." The motion is carried unanimously.

DR. MERILLAT: Mr. Chairman, I am informed by the chief veterinarian of the military service that it is customary for the various associations concerned to give medals to meritorious students in the Government military schools. Whoever makes a high grade in the school of dentistry is given a medal by the dental association. The same applies to the medical officer who makes a high grade in the medical school.

I would suggest, therefore, that the Association, through its Committee on Intelligence and Education, give the same recognition to the army veterinarians who attend the army veterinary school at Washington. I make that in the form of a motion.

DR. MAYO: Before I second that motion, I would like to have it so worded that it would include Canada, if we can.

In other words, I would like to have this referred to the Committee for consideration, and report upon this subject.

DR. MERILLAT: I didn't have in mind any other school than the U. S. Army Veterinary School, that has just recently moved from Chicago, and which will henceforth function as a department of the Army Medical School, where it belongs.

It would seem to me that if there were an analogous institution in Canada, the graceful thing to do is for this Association to give a like medal to any such Canadian military officers. I shall add that to my motion. My Canadian colleagues will pardon my omission.

. . . The motion was seconded by Dr. Mayo . . .

DR. MERILLAT: The import of the motion is for this Association to contribute a medal as a prize to the best student in the Army Medical School.

. . . The motion was carried . . .

PRESIDENT WELCH: We have a report from the Committee on Resolutions.

. . . President Welch read the report of the Resolutions Committee . . .

REPORT OF COMMITTEE ON RESOLUTIONS

Your Committee on Resolutions desires on behalf of the American Veterinary Medical Association to thank the Local Committee on Arrangements; the retiring President and other officers of the Association and all others who have contributed to the success of the sixtieth anniversary of this Association for their untiring efforts and hearty cooperation. More particularly do we wish to express the appreciation of the Association for the splendid work of Dr. Hoskins as Secretary-Editor of the Association and JOURNAL.

RESOLUTION COMMITTEE,
Robert Graham, Chairman.

PRESIDENT WELCH: At this time may I not personally extend, especially to the Canadians on the Committee of Local Arrangements, my appreciation of the splendid efforts they have made in contributing to the success of the meeting?

DR. MAYO: I have been, of course, in an official way, situated so that I have known what a local committee means to a meeting of this Association, and I want to say (and I speak in an ex-officio capacity) that this is one of the best veterinary association meetings we have ever had. I think it is second in point of attendance. I think at the Ohio meeting, two or three years ago, we had a larger attendance, and I wish to take this opportunity of telling the people of Canada how much we appreciate the splendid meeting that they have given us here in Montreal. (Applause.)

DR. KIERNAN: I recommend that we adopt that motion by rising.

. . . The men arose and applauded . . .

. . . The report of the Audit Committee was called for, but no member of that Committee was present . . .

DR. WILLSON: In the absence of the Chairman of the Committee on Local Arrangements, I desire to thank you most sincerely for the hearty vote of thanks that has been given our efforts to entertain you at this anniversary of the American Veterinary Medical Association. We feel we have done only our duty, and the pleasure has been as much ours as yours.

We may have fallen down in some respects, but it is almost impossible to have everything carried out in proper detail. If the Chairman of the Committee, Dr. Baker, had been present, he would have been delighted to thank you properly in better words than I can select, but we appreciate very much the numbers with which you have attended, and particularly the number of women who have been present.

As a member of the Entertainment Committee, it has been my duty to look after the women, and I assure you that it has been a pleasure. The ladies, as a matter of fact, were the most easily entertained of any I have ever seen.

We are pleased, indeed, to know that you appreciate our efforts.

PRESIDENT WELCH: We will now have the report of the Budget Committee.

. . . Dr. Hoskins read the report of the Budget Committee, as follows:

President's Contingent Fund	\$ 500
Intelligence and Education	1000
Legislation	1000
Treasurer	300
Horse Association	50
Extension Work	1000

These differ from the appropriations last year in two respects. There is no appropriation for the Committee on Abortion or the Committee on Revision of Constitution and By-laws.

. . . It was voted, on motion of Dr. Mayo, seconded by Dr. Hilton, that the report of the Budget Committee be approved . . .

PRESIDENT WELCH: Unfinished business. Under the head of

unfinished business, we have a couple of papers that have not been presented, that I am sure you will want to listen to. I will call on Dr. Murphey, on the subject of "Corpus Luteum of the Ox Ovary in Relation to the Estrous Cycle."

Dr. Murphey presented his paper on the above subject, and also an abstract of his second paper, "Studies of the Estrous Cycle of the Ox" . . . (Applause.) (Papers will be published.)

PRESIDENT WELCH: The papers are open for discussion. If there is no discussion, we will proceed to new business.

Secretary Hoskins read a message from Sir Frederick Hobday . . .

PRESIDENT WELCH: Is there anything further under the order of new business? If not, the next order of business is the installation of new officers.

I will ask Dr. Murphey to escort the new President to the Chair. (Applause.)

Gentlemen of the Convention, it affords me the greatest pleasure to present to you your new President for the new year. (Applause.)

PRESIDENT-ELECT STANGE: Mr. President, Gentlemen: I assure you that I accept this with a full realization of the responsibility it carries with it. I shall exercise the prerogatives of my office in the interests of harmony and progress. I trust that my administration, Mr. President, may be as satisfactory and as successful as that of my predecessor. Thank you. (Applause.)

PRESIDENT WELCH: Are there any of our Vice-Presidents here? (None were present.)

Our Treasurer has gone home, so that concludes the installation of officers.

If there is nothing further to come before us, a motion to adjourn will be in order.

. . . The meeting adjourned at four o'clock . . .

ADJOURNMENT

(To be continued)

The British Dairy Farmers' Association has awarded the gold medal to the government of Ontario for its collection of dairy produce, including bacon, poultry and eggs.

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WOMEN'S AUXILIARY

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Mrs. R. P. Marsteller, Secretary,	College Station, Texas.
Mrs. H. P. Hoskins, Treasurer,	Rosedale Park, Redford, Mich.

PERSONALS

Dr. James J. Black (K. S. A. C. '23) has accepted the position of Extension Veterinarian at the Kansas State Agricultural College, succeeding Dr. D. E. Davis, whose resignation was announced in the December issue of the JOURNAL.

Dr. Bruce Blair (U. P. '09), of New York City, has established the Jeanette Blair prize of \$50, at the University of Pennsylvania School of Veterinary Medicine, to be awarded to the senior student doing the best work in the small animal clinic. This is the second such prize to be established by an alumnus, Dr. T. E. Munce (U. P. '04) having previously established a prize of \$25, to be awarded for the best work in the course in animal industry.

WOMEN'S AUXILIARY LOAN FUND

The Women's Auxiliary to the American Veterinary Medical Association offered to lend, each year, beginning July 1, 1922, to a senior in attendance at one of the recognized veterinary colleges in the United States or Canada, a sum, not to exceed \$350.00 subject to the following conditions:

1. The student shall be recommended by the Chairman of the Committee on Intelligence and Education, of the A. V. M. A., and approved by the Chairman of the Executive Board of the same organization.

2. Scholastic attainment, financial need, character and recommendation from the Dean of the college or colleges which the applicant has attended, shall be factors determining the eligibility of the candidate.

3. When there is more than one applicant for the loan, order of selection shall be determined by rank of previous scholastic attainments.

4. This loan of \$350.00 shall be refunded to the Women's Auxiliary, with interest at 4%, in two, yearly installments of \$175.00 each; the first installment to be paid not later than one year after graduation, or the date on which the applicant is scheduled to graduate; the second installment to be paid not later than two years after graduation, or the date on which the applicant is scheduled to graduate.

5. In guarantee thereof the student shall furnish not less than two guarantors, endorsed by the Dean signing his application, that the sum will be paid within the specified time.

6. Each application, accompanied by its recommendation and guarantee, shall be presented to the Secretary of the Women's Auxiliary and must be approved by the President and Secretary of that organization.

7. The payments of the fund, and all matters connected with it, which are purely of a financial nature, shall be in the care of the Treasurer of the Women's Auxiliary, subject to the approval of the President and Secretary of that organization.

8. If, at any time, the funds of the Women's Auxiliary are sufficient for such purpose, additional loans may be made subject to the same conditions as the original loan for that year.

9. The power to grant these additional loans shall be vested in the Executive Committee of the Women's Auxiliary.

10. It is recommended that mention of the Loan Fund be made in the catalogues of every recognized veterinary college in the United States and Canada, and that a copy of the conditions under which the loan may be secured be filed in the office of the Secretary of each of these institutions.

11. When the funds of the Auxiliary have reached the sum of \$5000.00 the loans shall be withdrawn and the money placed, with suitable security, where it will bear interest.

12. This interest shall be used to establish a scholarship under conditions similar to those which apply to the loan, except that the money shall not be refunded to the Women's Auxiliary, but shall be a gift to the student fulfilling the specified requirements.

13. Any change in these requirements and conditions may be made by a two-thirds vote of all members present at any regular business meeting of the Women's Auxiliary, provided that such a change has been approved by the Executive Committee of that organization, and that full notice of the same has been included in the call for that meeting.

OTHER MEETINGS

NEBRASKA STATE VETERINARY MEDICAL ASSOCIATION

True to tradition the twenty-sixth annual meeting of the Nebraska State Veterinary Medical Association, held at Grand Island, December 11-12, 1923, was well attended and was much appreciated by all, both from the educational and social standpoints. The meeting was unique in that it was the first convention to be held in the new fireproof Hotel Yancey, just completed, of which the citizenry of Grand Island is justly proud. The building with all its modern conveniences contributed in a large measure to the success of the meeting.

The morning session of the first day was called to order by the President, Dr. D. W. Hurst, of Tecumseh, who, following roll-call by the Secretary, introduced Hon. T. W. Ellsberry, Mayor of Grand Island, who gave the address of welcome which was responded to by Dr. J. S. Anderson, of Lincoln. The president's address was the next in order and a great many valuable points were alluded to by Dr. Hurst which will long be remembered by those present.

The first subject on the program was a paper by Dr. G. A. Young, of Syracuse, "Dosage, Method of Administration and Toxicology of Oil of Chenopodium," this pertaining more particularly to swine. The paper was well written and presented, giving rise to much discussion which lasted until noon, when recess was taken until 1:30 p. m., the meeting to convene at the Blain Horse Pavilion, for a clinical session.

The clinic was above the average, judging from the interest manifested in the various demonstrations consisting of the following: "Spaying of Young Calves," by Dr. L. V. Skidmore, of Lincoln; "Round Worms in Swine" (Lecture and Demonstration), by Dr. H. B. Raffensperger, of Chicago, Ill.; "Nasal Polypus Operation in Horse," by Dr. J. S. Anderson, of Lincoln; "Ridgling Castration," by Dr. H. E. Bemis, of Ames, Iowa; "Poultry Judging and Medication," by Dr. C. E. Ackerman, of Wilber; "Restraint," by Dr. L. V. Lewman, of Big Springs. The clinic was in charge of Dr. A. A. Anderson, assisted by Drs. McGinnis, Foster and Rose.

The annual banquet, at 6:30 p. m., in the Hotel Yancey, was the social feature of the session, as it always is at the Nebraska

meetings, and if there are any out-of-state veterinarians who doubt the ability of our practitioners to enjoy themselves, they are cordially invited to come and see things at first hand, as did Dr. B. W. Conrad, of Sabetha, Kans., whose arrival was a pleasant surprise.

While partaking of the well prepared banquet, music was furnished by a specially selected portion of the famous Des Dunes Band, of Omaha, and the Y. M. C. A. Glee Club, of Grand Island, whose pleasing numbers were much enjoyed. The speaker of the evening, following the banquet, was Mr. G. W. Cowden, president of the local Chamber of Commerce, who extended a welcome to the visiting members, their wives and friends. Response was given by Dr. W. T. Spencer, of Lincoln. Short talks were given by Mr. W. I. Blaine, of Grand Island, Dr. H. E. Bemis, of Ames, Iowa, Dr. R. C. Moore, of St. Joseph, Mo., and Dr. D. W. Hurst, president of the Association.

Dr. L. Van Es, of Lincoln, having established his reputation as toastmaster at the 1922 banquet, was again called upon to act in like capacity this year, which he kindly consented to do and was true to form. Red carnations were the only decorations. The beauty of the banquet room needed nothing additional to make a perfect setting. Favors in the form of toy balloons and paper hats added merriment to the occasion. Dancing followed the speaking, lasting until 1:30, with music furnished by Powell's Orchestra, which completed an evening of perfect enjoyment.

At the morning session of the second day, following reports of the Secretary-Treasurer and of the various standing committees, the names of eleven applicants for membership were read, voted on and accepted. Dr. L. Van Es then presented his subject, "New Points on Tuberculosis," bringing out many interesting points to which he has been giving much attention during the past year.

The out-of-state guest this year was Dr. H. E. Bemis, of the Department of Veterinary Surgery of the Iowa State College, at Ames, Iowa, and to Dr. Bemis is given much credit for making the meeting a success. His subject, illustrated by lantern slides, "Surgery of the Head of the Horse and Ox," was intensely interesting and conveyed many practical ideas to the veterinarians in attendance.

The election of officers resulted as follows: Dr. W. J. Moslander, of Grand Island, President; Dr. H. E. Foster, of Kearney,

Vice-President; and Dr. F. R. Woodring, of Lincoln, re-elected Secretary-Treasurer.

Papers presented during the afternoon session were as follows: "General Cattle Practice," by Dr. P. Phillipson, of Holbrook; "The Viewpoint of the Breeder and Feeder on Swine Sanitation and Observation of Its Value in Nebraska," by Prof. M. B. Posson, of the University of Nebraska, Lincoln; "Points of Interest to Veterinarians," by Dr. L. R. Cantwell, Chief, Nebraska B. A. I.; "Differentiation of Diseases in Dogs Resembling Distemper," by Dr. F. Perrin, of Lincoln; "Practical Poultry Pointers," by Dr. C. E. Ackerman, of Wilber; "Observations on Some of Nebraska's Poisonous Plants," by Dr. J. M. Simpson, of Alliance; "The Ox Warble," by Dr. H. M. Martin, of Lincoln; and "Veterinary Corps of the National Guard," by Dr. C. J. Norden, of Lincoln.

Dr. Norden then explained a plan for a publicity campaign to be carried on by the Association for the coming year, which met with the approval of those present and a decision was made to enter into it. The purpose of the campaign is to let the public know something about what the profession stands for and is accomplishing.

Through the courtesy of the Chamber of Commerce and the local veterinarians and their wives, the visiting ladies were entertained. Luncheons, theatre parties and trips to points of interest about Grand Island made up a very enjoyable program for the ladies.

F. R. WOODRING, *Secretary-Treasurer.*

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS—MISSISSIPPI VALLEY DIVISION

The meeting of the Mississippi Valley Division of the National Association of Bureau of Animal Industry Veterinarians, held Dec. 15, 1923, at National Stock Yards, Ill., was well attended and many items of interest to the Bureau Veterinarians and the veterinary profession in general were discussed.

Drs. J. S. Jenison and L. C. Stewart, delegates to the recent convention of our Association, held at Chicago, rendered very interesting reports of the matters acted upon at the convention.

The following were elected officers of this Division for the

coming year: President, Dr. L. C. Stewart; Secretary, Dr. G. H. Bruns; Treasurer, Dr. S. L. Blount.

Those present at the meeting were: Drs. W. M. Robertson, J. W. Joss, G. H. Bruns, G. C. Pieper, F. S. Thurmon, H. J. Timmerman, C. R. Graham, W. L. Cohenour, F. E. Hill, S. L. Blount, A. R. Zumwalt, L. C. Stewart, T. Hartman, R. E. Surring, J. S. Jenison, R. C. Lambert, J. F. Pease, M. L. Crans and A. J. Maloney.

G. H. BRUNS, *Secretary.*

DELAWARE VETERINARY MEDICAL ASSOCIATION AND UNIVERSITY VETERINARY CONFERENCE

The annual meeting of the Delaware Veterinary Medical Association and University of Delaware Veterinary Conference was held at Wolf Hall on December 19. There was an excellent attendance at the meeting and the impression seemed to be unanimous that it was the best meeting ever held by the Association.

President McDaniel, of Dover, opened the meeting and delivered the address of welcome. The Secretary gave a report of the summer meeting at Rehoboth and reported also on the work of the Department of Animal Industry of the University carried out during the past year. It was pointed out to those assembled that since the agricultural experiment stations are supported by all the people, and that the specific role of the Animal Industry Department is to foster improvements in live stock and poultry production, the cooperation of the veterinarians is essential if the department is to live up to its obligations, and that it is the primary object of the University conferences to work out plans for the advancement of the animal industry of the state.

Dr. Morris L. Zurkow gave a very interesting and instructive talk on swine diseases, confining himself chiefly with the disease encountered in the field while investigating swine disease outbreaks.

Dr. W. G. Middleton, who is in charge of tuberculosis eradication in Delaware and New Jersey, gave a report upon the progress of this work in Delaware. The statistics quoted by Dr. Middleton make it quite plain that the disease is being eradicated in the cattle herds of this state.

Dr. T. E. Munce, State Veterinarian of Pennsylvania, addressed the conference upon the subject of "Live Stock Sanitary Control

Work." Dr. Munce demonstrated by the aid of maps and charts the plan of organization of the live stock sanitary work as carried out in Pennsylvania. This talk was very instructive and timely, and will doubtless prove a valuable guide and aid in promoting disease control work in this state.

Professor T. A. Baker, specialist in dairying, of the University of Delaware, discussed the subject of rations for the dairy cow. Prof. Baker has worked out a simplified and practical method of balancing dairy rations and, before explaining the method, each member was presented with a two-page, mimeographed sheet, showing in detail the method of compounding the ration.

Dr. F. P. Ruhl, of Milford, gave a very interesting report on several outbreaks of poisoning from poisonous plants.

Prof. H. R. Baker, of the University, presented a paper on "Bacillary White Diarrhea in Poultry."

Officers elected for the year are: Dr. H. P. Eves, Wilmington, President; Dr. C. C. Palmer, Newark, Secretary-Treasurer; Dr. F. P. Ruhl, Milford, Dr. H. B. McDowell, Middleton, and Dr. A. S. Houchen, Newark, members of the Executive Committee.

C. C. PALMER, *Secretary*.

CENTRAL CANADA VETERINARY ASSOCIATION

The annual meeting of the Central Canada Veterinary Association was held in the Council Chamber, City Hall, Ottawa, on January 16, 1924. A goodly number were present, including Dr. A. Dauth, representing the Quebec Veterinary Association, and a very profitable session was held. The president, Dr. Geo. Hilton, occupied the chair. Letters of regret at being unable to be present were received from Dr. T. C. Evans, Stanley Barracks, Toronto; Dr. W. J. R. Fowler, of the Ontario Veterinary College, Guelph; and Dr. W. C. McQuire, of Cornwall.

After the routine business had been disposed of, Dr. J. McL. Stuart, Veterinary Inspector, Department of Agriculture, Ottawa, gave a paper on the work of the Veterinary Corps in the Great War. Dr. E. A. Watson, Chief Pathologist, Department of Agriculture, Ottawa, gave a paper on Contagious Abortion. Dr. Geo. Rothwell, Dominion Animal Husbandman, spoke on the experiences and problems of the Experimental Farms with this disease.

A resolution, moved by Dr. J. B. Hollingsworth, Chief Food Inspector, Ottawa, seconded by Dr. W. C. Young, of Almonte,

that a committee of three members of this Association be appointed by the President to study the problem of contagious abortion and to collaborate with other similar committees and associations to promote means and measures of advancing the solution of the problem, was proposed and adopted. The President named Dr. J. B. Hollingsworth, of Ottawa; Dr. J. A. Bean, of Winchester; and Dr. W. C. Young, of Almonte, on this committee.

Dr. J. B. Hollingsworth spoke on the question of veterinary legislation, and with particular reference to the amendments to the Ontario Veterinary Practice Act, which it is proposed to submit at the present session of the Ontario Legislature. Following the reading of the papers, very interesting discussion was engaged in by the members, led by Dr. J. A. Bean, of Winchester, Dr. H. L. Perley, of Hanover, New Hampshire, and Dr. Abraham, of Kemptville.

Prior to the election of officers, Dr. Geo. Hilton, President for the past eleven years, thanked the members for the honor and support that had been accorded him during his time of office, but, owing to additional duties entailed in the position of Acting Veterinary Director-General, he requested that someone else be elected as President of the Association. This was reluctantly assented to, and a standing vote of thanks was unanimously passed, expressing the appreciation of the members for the valuable assistance that Dr. Hilton had given during his tenure of office as President.

Applications for membership were received from Dr. J. McL. Stuart, Veterinary Inspector, Ottawa; Dr. Norman Beaver, Veterinary Inspector, Ottawa; and Dr. Geo. E. Stanley, of the Pathological Division, Ottawa.

The report of the nominating committee was received, and the following officers duly elected for the ensuing year:

Honorary Patrons, Hon. W. R. Motherwell and Dr. J. H. Grisdale; Honorary President, Dr. Geo. Hilton; President, Dr. J. A. Bean; Vice-President, Dr. A. W. Harris; Secretary-Treasurer, Dr. W. H. Marriott; Council, Drs. O. Hall, F. Fisher, J. Bordeau, W. C. Young, W. Nicholls, J. B. Hollingsworth, P. W. O'Hara and Dr. Geo. Hilton; Auditors, Drs. H. D. Sparks and J. McGregor.

W. H. MARRIOTT,
Secretary-Treasurer.

COMMUNICATION

TO THE EDITOR:

I take pleasure in informing you that in connection with the fortieth anniversary of the Bureau of Animal Industry, next May, a book dealing with the work of the Bureau from its beginning up to the present time is in course of publication. In response to frequent requests for authentic information conveniently arranged, Dr. U. G. Houck, of the Bureau, has prepared the material, aided by chiefs of the various divisions and offices.

The book gives the history of the Bureau of Animal Industry, its development, and its current activities. It contains especially complete discussion of accomplishments in veterinary work. It also contains the answers to many questions constantly arising with respect to Government live stock research and field activities.

The book will contain about 300 pages, 6" x 9", and will be substantially bound in cloth. The public printing fund is not available for publishing a book of this kind, consequently it will be printed by a private concern and distributed at cost price. If only 1,000 copies are printed, the cost will be approximately \$1.75 per copy. On the basis of 3,000 copies, the cost will be in the neighborhood of \$1.00 per copy. It is hoped that the subscriptions will exceed 3,000.

The edition will be limited to the number of subscriptions received within the next 60 days. We desire to secure as many subscriptions as possible, and would be pleased if you would bring this matter to the attention of other friends of the Bureau in your community who might desire a copy. Bills will be sent when the books are ready for delivery. All subscriptions and other communications in regard to this matter should be mailed to Dr. U. G. Houck, The Manchester, 1426 M Street Northwest, Washington, D. C.

J. R. MOHLER.

Washington, D. C., January 15, 1924.

NECROLOGY

DR. ALBERT BUCK

Dr. Albert Buck, of Urbana, Ohio, died November 29, 1923, following an attack of apoplexy, suffered immediately following a football game at Bellefontaine, which he had attended with his sons.

Born at Rosewood, Ohio, June 14, 1878, Dr. Buck, received a common school education, including a teacher's certificate, and then entered the Western Veterinary College, of Kansas City, Mo. He was graduated from this institution in 1903. He first located at Crayon, later moving to Urbana, about 1911.

Dr. Buck joined the Ohio State Veterinary Medical Association in 1911 and the American Veterinary Medical Association in 1920. He was a Mason, a member of the Shrine Club, the Odd Fellows and the Loyal Order of Moose. He married Miss Ida May Bradson, at Urbana, February 3, 1900, and to this union eight children were born. In addition to his widow and eight children, Dr. Buck is survived by his mother, a brother, a half-brother and a sister.

I. I. SCHMIDT

In the July 1923 issue was noted the reported death of Dr. I. I. Schmidt, of Kolding, Denmark. As stated in the August issue, this report proved to be very badly exaggerated, as Dr. Schmidt was alive and well at that time. Again we have received a report of the death of Dr. Schmidt, this time believed to be authentic.

Few men have to their credit any discovery that has been of as great value to the live stock industry as Dr. Schmidt's discovery of a cure for milk fever. It is all the more to his credit that he made no attempt to keep his treatment a secret or to capitalize on it in any way.

It is said that Dr. Schmidt died a comparatively poor man, which is one of the greatest tributes that could be paid him, considering what his discovery was actually worth. He gave it freely to the world and his only reward was the honor that went with it—a rich honor, not measured by gold.

FRED A. WILSON

Dr. Fred A. Wilson, of Green Bay, Wis., died December 1, 1923. He was a graduate of the Ontario Veterinary College, class of 1895, and one of the leading practitioners of the Badger State. He held license 17 from the State Board of Veterinary Examiners.

Dr. Wilson was a member of the Wisconsin Veterinary Medical Association. He joined the A. V. M. A. in 1910.

JOHN THOMSEN

Dr. John Thomsen, of Armstrong, Iowa, died recently, at the age of 59. He was a graduate of the Ontario Veterinary College, class of 1895. He joined the A. V. M. A. in 1916. He was a member of the Iowa Veterinary Association. Death was caused by heart trouble.

HOWARD J. WATKINS

Dr. Howard J. Watkins, of Memphis, Tenn., died in the Baptist Memorial Hospital, Memphis, January 4, 1924, following an operation for appendicitis.

Born in Memphis, April 15, 1892, Dr. Watkins took three years of high school work and then entered the McKillip Veterinary College. He was graduated in 1918. He joined the A. V. M. A. the following year. He was a member and officer of the Memphis Kennel Club.

Dr. Watkins is survived by his father and mother, three brothers and two sisters.

MARRIAGE

Dr. Gail M. Umberger (K. S. A. C. '19), of Harveysville, Kansas, to Miss Georgia Johnson, December 22, 1923.

BIRTHS

To Dr. and Mrs. J. S. Barbee, of Sutton, Nebr., a son, James S., Jr. November 3, 1923.

To Dr. and Mrs. M. C. Linnemann, of St. Joseph, Minn., twins, a daughter, Myra Kathleen, and a son, Iver Martin, November 13, 1923.

To Dr. and Mrs. Wallace, of North Bend, Nebr., a son, Ordean, October 24, 1923.

To Dr. and Mrs. E. W. Youngblood, of Union City, Tenn., a daughter, Margaret Abbe, November 15, 1923.

To Dr. and Mrs. T. J. Eagle, of New Hampton, Mo., a son, Hugh John, December 16, 1923.

To Dr. and Mrs. J. W. Benner, of Ithaca, N. Y., a daughter, Mary DeNell, December 17, 1923.

To Dr. and Mrs. Harry F. Seymer, of Milwaukee, Wis., a daughter, Luella Emily Marie, December 11, 1923.

PERSONAL

Dr. J. A. Theoret (Laval '13) has removed from Montreal to Berthierville, Quebec.

Dr. W. L. Hanson (McK. '08) has removed from Greene, Iowa, to Corning, same state.

Dr. George T. Hill (K. S. A. C. '12) is City Meat and Milk Inspector of Topeka, Kans.

Dr. DuBois Jenkins (Corn. '18) has removed from Cobleskill, N. Y., to Warwick, N. Y.

Dr. R. J. Robertson (San. Fran. '17) has removed from Richmond, Calif., to Phoenix, Ariz.

Dr. N. B. Smith (O. S. U. '93), of Billings, Mont., writes: "Couldn't get along without the JOURNAL."

Dr. James W. Crouse (U. P. '15) is with the Bureau of Animal Industry of New Jersey, stationed at Trenton.

Dr. Glen Biddle (Ont. '10), of Bryan, Ohio, is manager of The Jefferson (Registered) White Collie Kennels.

Dr. G. H. Myland (K. S. A. C. '04) is City Commissioner of Streets and Public Utilities, of Horton, Kansas.

Dr. G. S. Jackson (Ind. '13) has removed from Birmingham, Ala., to 7709 Snowden St., Pittsburgh, Pa.

Dr. L. B. Graham (St. Jos. '09), of Cedar Rapids, Iowa, is president of the Iowa Tamworth Swine Association.

Dr. Fred A. Spade (Gr. R. '17), formerly at Constantine, Mich., is now at 147 W. Chicago St., Coldwater, Mich.

Dr. G. P. Mayer (Chi. '16) has changed his base of operations from Petoskey, Mich., to 238 Leslie St., Lansing, Mich.

Dr. E. A. Caslick (Corn. '21), of Lexington, Ky., spent the Christmas season with his parents, at Newfield, N. Y.

Dr. L. E. Long (Chi. '210) is now located at Princeton, Ill., as County Veterinarian on tuberculosis eradication work.

Lt. James E. Noonan (Ont. '11) has been transferred from Camp Thuax, Stithton, Ky., to Fort Benjamin Harrison, Ind.

Dr. J. R. Starkey (K. S. A. C. '22) is building a small animal hospital in connection with his practice at Blackwell, Okla.

Dr. R. Riddell (Ont. '80) has changed locations, from Seattle, Wash., to 460 Chester St., Victoria, British Columbia, Canada.

Dr. Carl J. Norden (K. C. V. C. '11), of Lincoln, Nebr., has received a major's commission in the Veterinary Reserve Corps.

Dr. Marnie E. Wesner (Terre Haute '12), of Ohio, Ill., writes: "The JOURNAL has many good things for the veterinarian."

Dr. F. B. Hadley (O. S. U. '07), of the University of Wisconsin, has received a commission as Captain in the Veterinary Reserve Corps.

Dr. Victor G. Kimball (Corn. '08) of the University of Pennsylvania Veterinary Faculty, was recently confined to his bed by illness.

Dr. F. E. Hill, formerly stationed at Nebraska City, Nebr., has been transferred to the meat inspection force at National Stock Yards, Ill.

Dr. William G. Keehn (K. C. V. C. '11), of Kansas City, Mo., has received a commission as first lieutenant in the Veterinary Reserve Corps.

Dr. R. J. Schermerhorn (San. Fran. '14) has removed from Elgin, Ill., to Redlands, California. His new address is 106 E. Citrus Avenue.

Dr. F. H. McNair (Corn. '05) was among those who lost their homes and contents in the fire which visited Berkeley, Calif., in September.

Dr. Wm. T. Conway (Harv. '01) has been transferred from New Haven, Conn., to Pittsburgh, Pa., in the B. A. I. meat inspection service.

Dr. Leslie G. Marshall (U. P.), of Towanda, Pa., has returned from a business trip to Texas, where he was looking after his oil interests.

Dr. V. W. Knowles (K. C. V. C. '07), of Ronan, Mont., has requested that his JOURNAL be sent to him at Miami, Florida, until further notice.

Dr. Thomas Hartman was recently transferred from Kansas City, Kansas, to National Stock Yards, Ill., in the B. A. I. meat inspection service.

Dr. R. M. Mullings (N. Y. C. V. S. '89) has been transferred from South St. Paul to New Haven, Conn., in the B. A. I. meat inspection service.

Dr. H. C. Hughes (K. C. V. C. '12), formerly in practice at Scott's Bluff, Nebr., has accepted a position with the Detroit (Mich.) Board of Health.

Dr. H. W. Graybill (Geo. Wash. '11), formerly located at the Rockefeller Institute of Animal Pathology, at Princeton, N. J., is now in Berkeley, Calif.

Dr. T. H. Ferguson (Ont. '96), of Lake Geneva, Wis., was recently elected a director and vice-president of the Farmers' National Bank of Lake Geneva.

Dr. B. Harry Sayre (K. C. V. C. '08), formerly with the Bureau of Animal Industry, at Sioux Falls, S. Dak., has resumed practice at Centerville, So. Dak.

Dr. Wm. Albertson Haines (U. P. '07), of Bristol, Pa., has been appointed, by Governor Pinchot, on a committee to investigate Pennsylvania farm conditions.

Dr. S. J. Gibson (Ont. '07), formerly of Govan, Sask., is now located at Souris, Man., with the Dominion Dept. of Agriculture, Health of Animals Branch.

Dr. John N. Rosenberger (U. P. '10), of Wycombe, Pa., was recently elected Secretary-Treasurer of the Pennsylvania Farmers' Cooperative Association.

Dr. Emil Pohl (O. S. U. '91), of Buffalo, N. Y., is reported to be recovering slowly from an illness dating back five months, during which time he was confined to his home.

Dr. T. E. Munce (U. P. '04), State Veterinarian of Pennsylvania, addressed the annual meeting of the county agents of Pennsylvania, at State College, Pa., on January 7, 1924.

Dr. Geo. E. Totten (Chi. '98), for several years in charge of B. A. I. meat inspection work at Pittsburgh, Pa., has been placed in charge of the same project at South St. Paul.

Dr. A. J. Allott (Corn. '17), of Newburgh, N. Y., with his wife, were in an automobile accident, in Cleveland, recently. Dr. Allott writes that "We are just getting to rights again."

Dr. H. T. Carpenter (Ont. '88), of Detroit, Mich., was confined to the hospital for about two weeks recently, with gangrene of one finger. Heroic surgical treatment saved the finger.

Dr. M. R. Higbee (McK. '11), of Albert Lea, Minn., writes that he is "doing fine now." He was sick for four months the past summer, and underwent a serious operation in October.

Dr. W. D. Foss (K. S. A. C. '23) has located at Cooperstown, N. D., succeeding Dr. H. O. Helmer. Dr. Foss is interested in German police dogs, and has some fine specimens for sale.

Dr. A. F. Schalk (O. S. U. '08) has returned to his post of duty at the North Dakota Agricultural College, after an absence of six months, spent in pursuing post-graduate work, in Chicago.

Drs. V. A. Moore and W. A. Hagan, of the Cornell Veterinary Faculty, attended the annual meeting of the Society of American Bacteriologists, in New Haven, Conn., during Christmas week.

Dr. Miller F. Barnes (U. P. '11), Director of the Penna. B. A. I. Laboratory, Philadelphia, Pa., recently addressed the Lancaster County (Pa.) Holstein-Friesian Association on the subject of "Abortion."

Dr. Joseph Hawkins (Ont. '71), of Detroit, Mich., has presented to the A. V. M. A. library a set of Gamgee's "Our Domestic Animals in Health and Disease," in four volumes, published over fifty years ago.

Drs. Francis L. Gallagher (Corn. '06), of Dover, Del., B. A. Gallagher (Corn. '01), of Washington, D. C., and W. C. Snyder (Corn. '18), of Watertown, N. Y., visited relatives in Ithaca, N. Y., during the Christmas holidays.

Dr. George E. Jorgenson (McK. '15), of Clermont, Iowa, who has been taking post-graduate work at Cornell University for some time, accompanied by Mrs. Jorgenson, left for an extended trip through the West, February 1st.

Dr. Thomas D. James (U. P. '08), of Scranton, Pa., has been made a member of the Board of Governors of the Lackawanna Kennel Club. At its recent show this club had two more entries than the show held in Madison Square Garden.

Dr. H. R. Church (Ont. '92), Deputy State Veterinarian of Pennsylvania, was one of the speakers at the regular meeting of the Philadelphia Club for Horsemen, held in Pearson Hall, U. of P. School of Veterinary Medicine, January 16, 1924.

Lt. Lloyd C. Ewen (U. P. '17) is the proud owner of "Ranger," winner of first place and a silver cup in the class for Officers' Chargers, at Fort Ethan Allen, Vermont, on October 31, 1923. "Ranger" has won in many shows, both civilian and military.

Dr. Louis A. Klein (U. P. '97), of Philadelphia, Pa., addressed a combined meeting of the Jefferson County (Pa.) Medical Association and the Mahoning Valley Veterinary Club, at Reynoldsville, Pa., on January 17, 1924, on the subject of "Tuberculosis and Our Milk Supply."

Dr. S. W. Haigler (McK. '19) has discontinued his practice at Bellflower, Ill., and is now associated in practice with Dr. J. C. Flynn, of Kansas City, Mo. Dr. Haigler practiced at Bellflower for five years, and was recently elected president of the McLean County (Ill.) Veterinary Association.

Dr. H. E. Van Der Veen (Chi. '17), of Lake Geneva, Wis., was elected Post Commander of Frank Firesen Post No. 24 of the American Legion at Lake Geneva for the year 1924, on Dec. 23, 1923. On the same night his brother was elected Post Commander of the local Legion Post at Hebron, Ill. Dr. Van Der Veen also served the Walworth (Wis.) Post as Commander for the years 1919, 1920 and 1921.

Dr. W. S. Newman (Corn. '07) has been appointed assistant coach of the Cornell University crews. Dr. Newman was prominent in athletics while at Cornell. He rowed bow oar on the Varsity crew in 1906 and 1907. He was center on the football team for three years, and helped to establish boxing as a sport at Cornell. Dr. Newman has resigned from the government service, and began active work with John Hoyle, the head coach, on January 7.

Dr. J. H. Coffman, Assistant State Veterinarian of the Georgia Department of Agriculture at Atlanta, spent a week in the Veterinary Science laboratories at the University of Wisconsin. The object of his visit was to secure first-hand information relative to the technic employed in conducting some of the newer diagnostic tests for animal diseases that have been developed and perfected at this college. During the years 1915-17, Dr. Coffman was a member of the staff of the Wisconsin Agricultural Experiment Station.

Dean V. A. Moore, on Dec. 20th, gave an address before an audience of 150 at Cortland, N. Y., on the subject "Bovine Tuberculosis and Its Relation to the Community." The meeting was under the auspices of the Accredited Herd Committee, the Cortland County Farm Bureau, and the Holstein-Friesian Association. The *Cortland Standard* published the address in full. Dr. Moore dealt with the early history of bovine tuberculosis, showing that it had its inception in the United States as late as 1870. He emphasized the ways in which the disease had been spread, the relation of the disease to human tuberculosis, and particularly the manner of eradication. He emphasized the value of community spirit in the working of some such plan as the area plan in ridding the cattle of a community of tuberculosis, and thus not only making the milk safer for human consumption but increasing the market for cattle of such an area. Dr. E. V. Moore (Corn. '17) and Dr. L. T. Faulder also gave short talks which were well received.

